



AMPLIFIERS

RF Amplifiers: KHz to 2000 MHz

Low Noise Amplifiers: 1 dB Noise Figure

Power Amplifiers: to 2 Watts; IP2 > 70 dBm

Limiting Amplifiers: Gains to +52 dB

* GUARANTEED LOW PHASE NOISE AMPLIFIERS *

VCO's

Hermetic-30 MHz to 5000 MHz

Attenuators

Voltage Variable and Digital

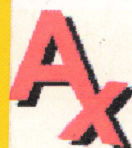
Switches

SPST to SP8T

Detectors

Threshold and Level

Amplifonix, Inc.
2707 Black Lake Place
Philadelphia, PA 19154



Tom Moore
Sales Manager
Cell: 215-327-1250
Email: tmoore@amplifonix.com

The Amplifonix Mission

Amplifonix will strive to provide **Total Customer Satisfaction** by manufacturing and delivering the industry's highest quality RF products, which consistently meet and exceed our customers' expectations for performance, price and delivery. We will ensure ongoing **Total Customer Satisfaction** through continuous improvements in our products, processes and people.



Amplifonix is located in a 20,000 square foot modern facility in Northeast Philadelphia, PA. The building was constructed to Amplifonix's specifications which included a 4,000-sq. foot Class 100,000 hybrid manufacturing room. The Amplifonix Engineering group has over 100 years of combined design experience with Amplifiers, VCO's and other Control Devices. Our engineers actively use computer-aided design programs to quickly analyze and design circuits and develop hybrid layouts.

All prototype units are manufactured and tested using production personnel to ensure a smooth and effective transition from development to production. The test facility includes computer automated test sets which allow for rapid testing of devices and S-Parameter data to be supplied as required. Amplifonix manufacturing also operates assembly and test on all three (3) shifts ensuring rapid turn around of all orders.

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Table of Contents

Phase Noise Information	3-11
Application Notes	12-15
Production Process.....	16
Quality Background	17-18
Cascade Information	19-22
Component Evaluation Board	23
 Amplifiers	
Higher Power	24-25
Low Noise	26-28
Higher Gain	30-32
Bi-Polar Designs	33-38
Lower Power	39-44
Lower Voltage	45
Full Datasheets	46-341
Amplifier Direct Cross List	342-346
 VCO Application Notes	
VCO List of Products	347-348
Datasheets	349
Datasheets	350-396
 Limiting Amps, Limiters	
Datasheets	397
Datasheets	398-406
 Detectors	
Datasheets	407
Datasheets	408-411
 Attenuators	
Voltage Variable, Digital Attenuators	412
Datasheets	413-427
Linearizers, Linearized Attenuators	428
Datasheets	429-431
 Switches	
Pin Diode and GaAs	432-433
Datasheets	434-460
 Amplifier Outline Drawings.....	
VCO Outline Drawings	461-463
Limiting Amp, Limiter and Detector Outline Drawings	464
Digital Attenuator Outline Drawings	465-466
Voltage Variable & Linearized Attenuators & Linearizer Outline Drawings.....	467-468
Switch Outline Drawings	469-470
Switch Outline Drawings	471-472

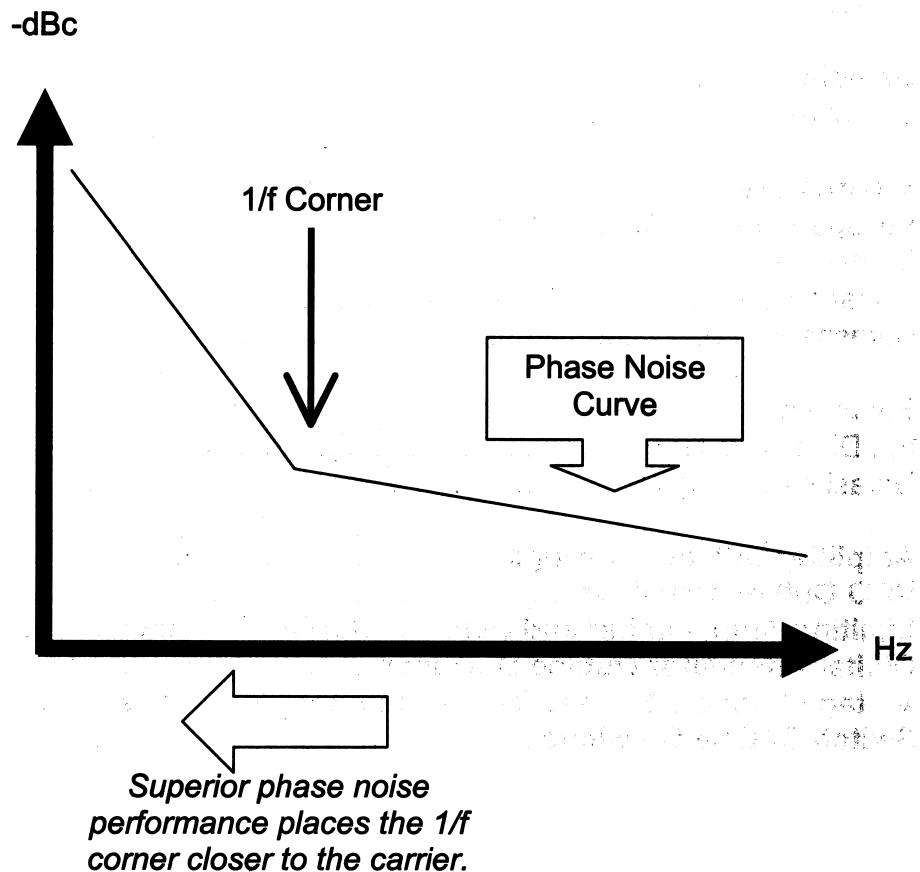
Phase Noise

A Brief Discussion

What is it?

Every signal has phase noise to some degree, sometimes it is seen as jitter of some kind, but simply put, it is unwanted noise on both side of the carrier signal caused by random variations of the frequency and phase of the carrier. Even the best crystal oscillators and signal generators have some degree of phase noise, expressed in dBc/Hz.

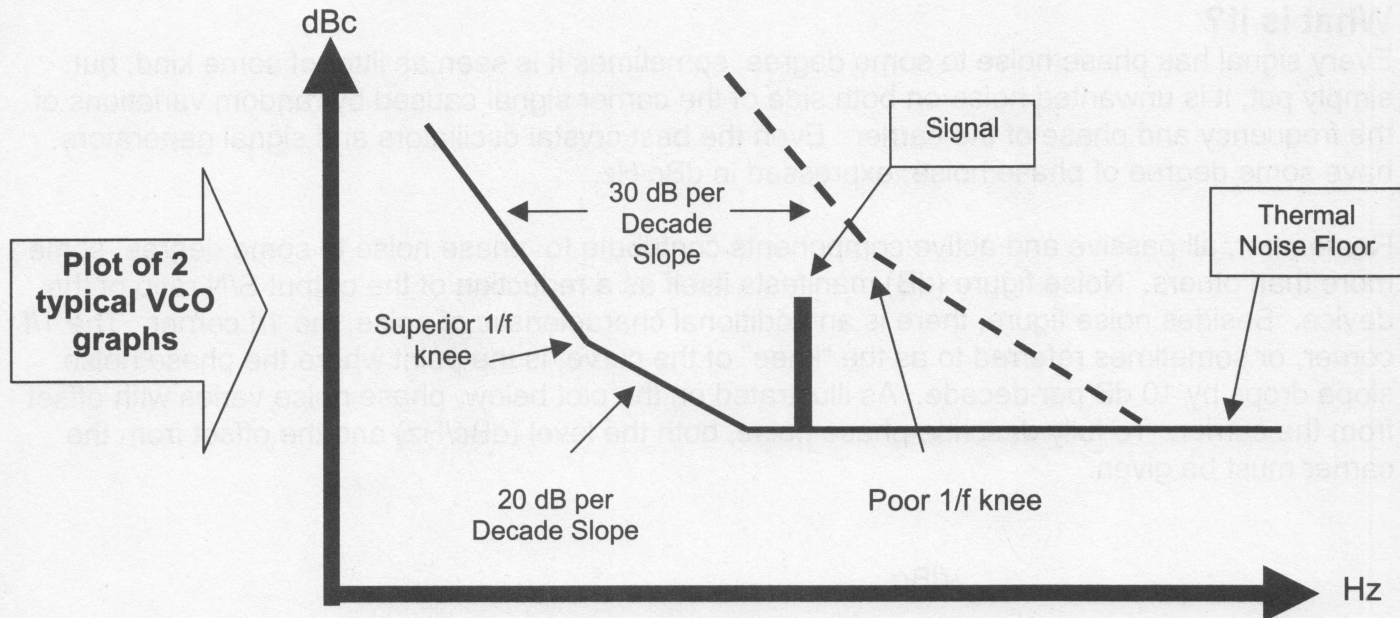
Remember, all passive and active components contribute to phase noise to some degree, some more than others. Noise figure (dB) manifests itself as a reduction of the output S/N ratio of the device. Besides noise figure, there is an additional characteristic of noise, the $1/f$ corner. The $1/f$ corner, or sometimes referred to as the “knee” of the curve, is the point where the phase noise slope drops by 10 dB per decade. As illustrated on the plot below, phase noise varies with offset from the carrier. To fully describe phase noise, both the level (dBc/Hz) and the offset from the carrier must be given.



Phase Noise

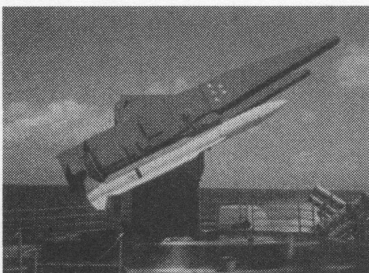
Why is Superior Phase Noise important?

As the graph illustrates, a poor 1/f knee places the signal into the thermal noise region. Moving the 1/f corner closer to the carrier results in removing the noise from the signal.

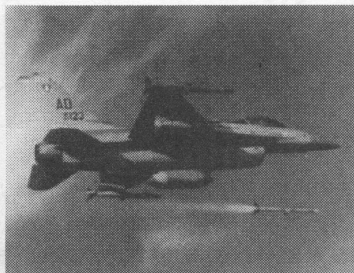


How Phase noise effects Doppler Radar, Missile Illuminators, and other Data Transmission Systems.

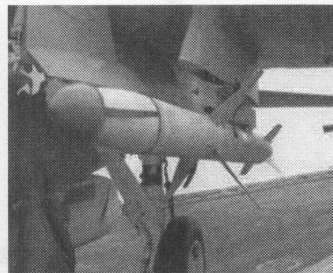
Low phase noise is a key element in a Missile Illuminator. For example, the objective of the system is to detect and amplify small reflected target signals. Simply put, degraded phase noise can result in the loss of the intended target signal.



Standard Missile



AMRAAM Missile



HARM Missile

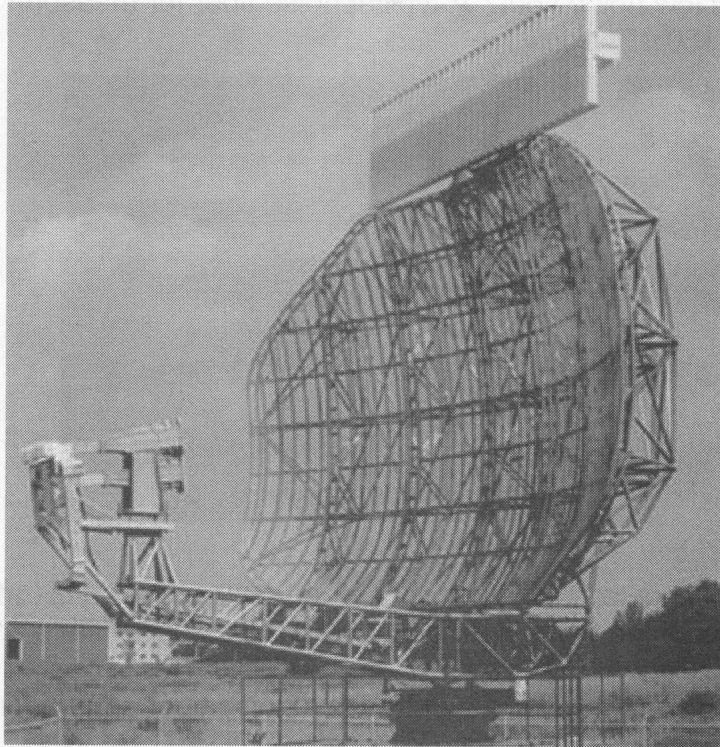


Patriot Missile

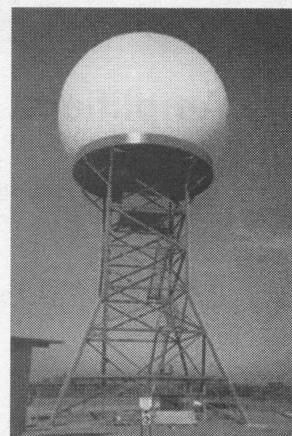
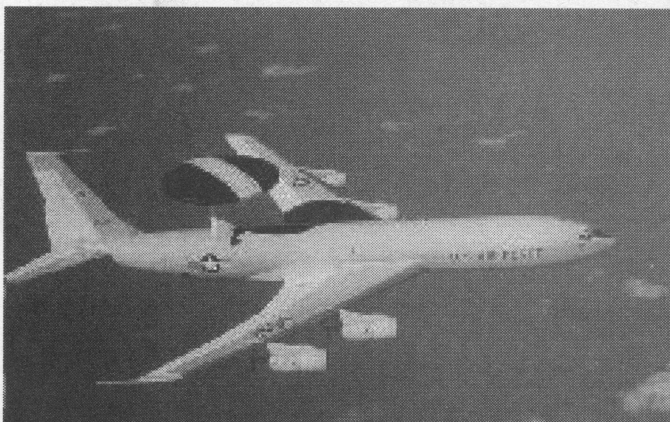
(Active Amplifonix Programs)

Phase Noise

Degraded phase noise also impacts the bit error rate (BER) of all data transmission systems. Improving the phase noise results in substantial BER performance improvement by increasing the S/N ratio in the receiver.



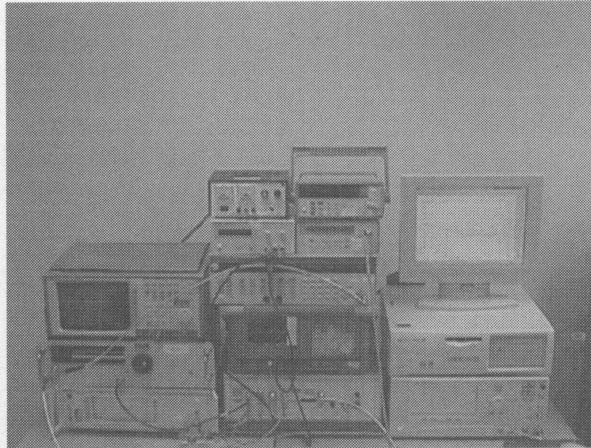
For all Doppler Radar designs, improving the subclutter visibility (SCV) is the bottom line. This allows the radar to see small moving objects on its screen. Excessive phase noise will degrade the SCV of the system. Improving the phase noise however increases the cancelled S/N ratio thereby improving the SCV.



Phase Noise

How is Phase Noise measured?

Unlike measuring phase noise in a VCO, amplifiers require a much more sensitive measuring system with an extremely low noise floor. A typical noise floor for measuring VCO's may only be on the order of -145 to -150 dBc/Hz.



For low phase noise amplifiers, a noise floor of at least -180 @100K Hz (offset from the carrier) is required in order to minimize the noise floor contribution to the amplifier's additive phase noise. Amplifonix accomplishes this feat using an Agilent ES5500 system coupled with an IFR low noise synthesizer. This enables us to meet the required low noise floor criteria for measuring low phase noise amplifiers.

Visit the Amplifonix website for a list of the recent developments in Low Phase Noise Amplifier Technology.

www.amplifonix.com



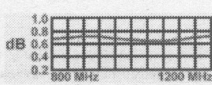
Amplifonix
The RF Component Source

Contact Us
Catalog Request
Request for Quote
Engineering Tools & Notes
Company Information & Tour

Product Feature
1000 to 2000 MHz Switches
10ns Switching Speed
0.5 dB Insertion Loss

Part/Keyword Search >> Search >> Cross Reference Guide

Products
Amplifiers
VCOs
Limiting Amplifiers
Switches
Linearizers
Limiters
Analog Attenuators
Digital Attenuators
Detectors

Amplifiers
Guaranteed Low Phase Noise

High Power Amps
... up to 2 watts

Low Noise Figure


Phase Noise Sample Datasheet

RF AMPLIFIER MODEL **TM5155PM**

Available as: TM5155PM, 4 Pin TO-8 (T4)
TN5155PM, 4 Pin Surface Mount (SM3)
FP5155PM, 4 Pin Flatpack (FP4)
BX5155PM, Connectorized Housing (H1)

Features

- High 3rd Order Intercept: +37 dBm Typical
- Medium Gain: 15 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	15.0	15.0 ± 1.0 Min.
Power @ 1 dB Comp. (dBm)	>+22	+21 Min.
Reverse Isolation (dB)	-17	-16 Max.
VSWR In Out	<1.75:1	2.0:1 Max.
Noise figure (dB)		
Power Vdc mA		

Each "PM" option datasheet provides phase noise performance.

Note: Care should always be taken to effectively ground the case of the unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +54 (Typ.)
Second Order Two Tone Intercept Point +48 (Typ.)
Third Order Two Tone Intercept Point +37 (Typ.)

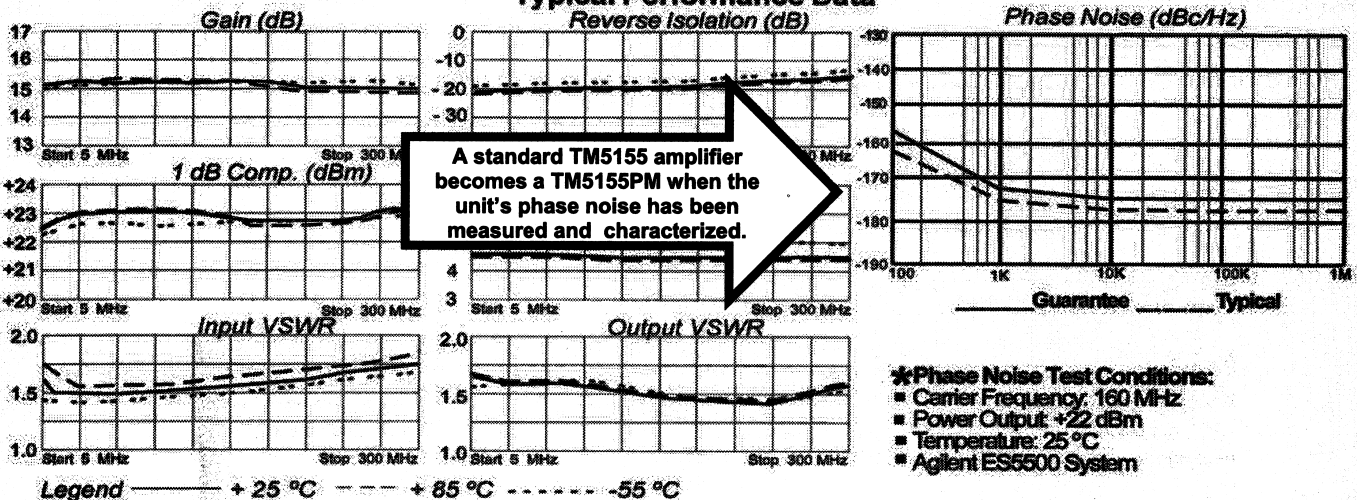
Maximum Ratings

Ambient Operating Temperature -55 °C to +100 °C
Storage Temperature -62 °C to +125 °C
Case Temperature +125 °C
DC Voltage +17 Volts
Continuous RF Input Power +13 dBm
Short Term RF Input Power 50 mW (1 Minute Max.)
Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-162	-158
1 KHz	-175	-172
10 KHz	-178	-175
100 KHz	-178	-175
1 MHz	-178	-175

Typical Performance Data



Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.24	-30	5.73	-166	.090	15	.25	83
10	.20	-30	5.86	-175	.092	8	.23	25
50	.19	-33	5.96	-168	.094	9	.22	-15
100	.19	-33	5.90	-162	.101	4	.19	-41
150	.20	-50	5.88	-137	.108	5	.18	-69
200	.21	-71	5.87	-122	.120	3	.15	-105
300	.24	-111	5.59	91	.143	-5	.16	163

Amplifonix

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Phase Noise Sample Datasheet

RF AMPLIFIER MODEL *TM6509PM*

Features

- Superior Phase Noise Performance
- High Output Power: +23 dBm Typical
- High Dynamic Range: IP3 = +36 dBm Typ.
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.5	13.0 Min.
Power @ 1 dB Comp. (dBm)	+23	+20 Min.
Reverse Isolation (dB)	-18	-15 Max.
VSWR In	<1.4:1	2.0:1 Max.
VSWR Out	<1.2:1	2.0:1 Max.
Noise figure (dB)	4.6	6.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Part: TM6509PM 4 Pin TO-8 (T4)

If you are using the Avantek UTO-509, our TM6509PM offers Superior Phase Noise performance.

Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

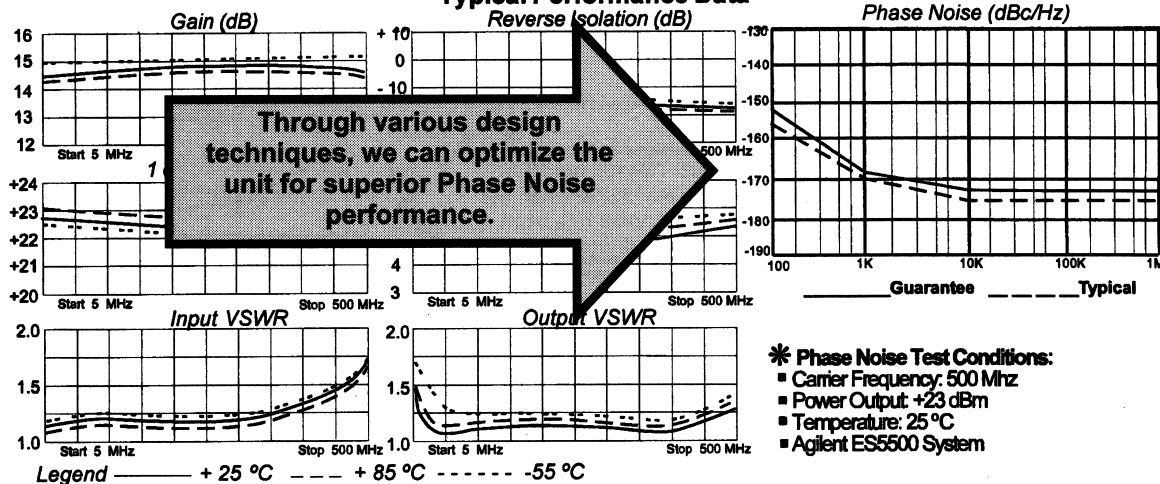
Maximum Ratings

Ambient Operating Temperature -55°C to +100 °C
 Storage Temperature -62°C to +125 °C
 Case Temperature +125 °C
 DC Voltage +13 Volts
 Continuous RF Input Power +13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz)*

Frequency	Typical	Guarantee (min.)
100 Hz	-156	-152
1 KHz	-170	-168
10 KHz	-175	-172
100 KHz	-175	-172
1 MHz	-175	-172

Typical Performance Data



* Phase Noise Test Conditions:

- Carrier Frequency: 500 MHz
- Power Output: +23 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.23	-41	5.86	-163	.08	19	.27	86
100	.13	80	5.46	159	.11	3	.05	23
200	.40	24	5.51	137	.12	3	.04	23
300	.58	-31	5.50	114	.14	2	.04	45
400	.10	-91	5.53	90	.15	-1	.08	71
500	.20	-137	5.45	64	.17	-9	.17	66

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Phase Noise Sample Datasheet

RF AMPLIFIER

MODEL **TM5125PM**

Available as: TM5125PM, 4 Pin TO-8 (T4)
TN5125PM, 4 Pin Surface Mount (SM3)
BX5125PM, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- High Power: +24 dBm Typical
- Low Noise: 2.0 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	20.5	19.5 Min./21 Max.
Power @ 1 dB Comp. (dBm)	+24.0	+22.5 Min.
Reverse Isolation (dB)	-24	-23 Max.
VSWR In	1.7:1	2.0:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	80	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

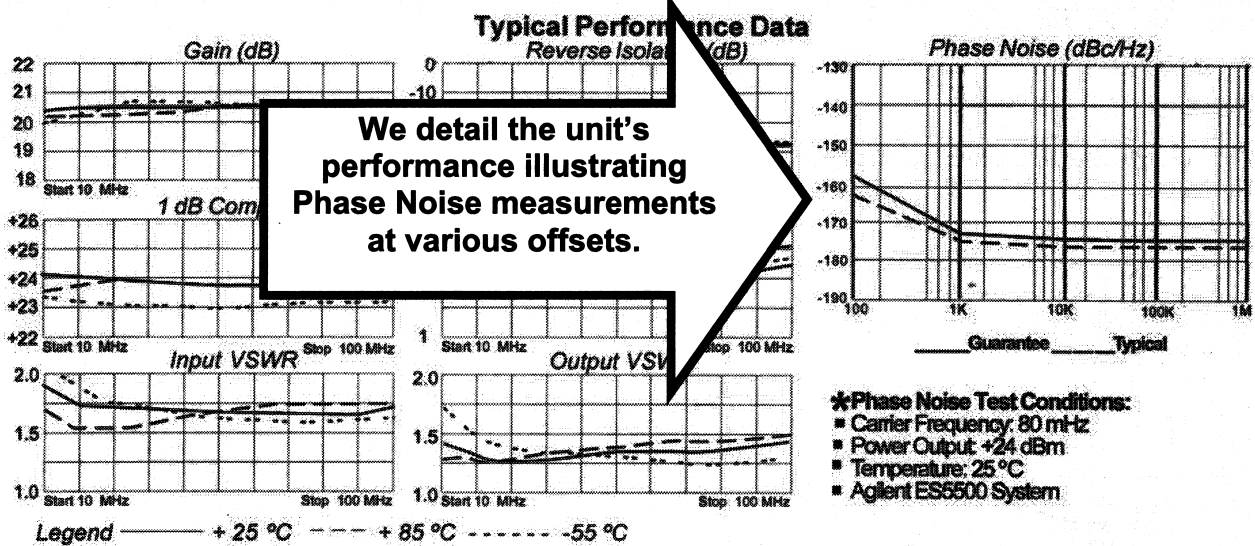
Second Order Harmonic Intercept Point	+58 (Typ.)
Second Order Two Tone Intercept Point	+52 (Typ.)
Third Order Two Tone Intercept Point	+40 (Typ.)

Maximum Ratings

Ambient Operating Temperature	-55°C to +100 °C
Storage Temperature	-62°C to +125 °C
Case Temperature	+125 °C
DC Voltage	+18 Volts
Continuous RF Input Power	+13 dBm
Short Term RF Input Power	50 mW (1 Minute Max.)
Maximum Peak Power	0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-162	-158
1 KHz	-175	-172
10 KHz	-176	-174
100 KHz	-176	-174
1 MHz	-176	-174



*Phase Noise Test Conditions:

- Carrier Frequency: 80 MHz
- Power Output: +24 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11 Mag	S11 Deg	S21 Mag	S21 Deg	S12 Mag	S12 Deg	S22 Mag	S22 Deg
5	.39	-32.94	9.94	-151.50	.05	-151.80	.26	-19.89
10	.29	-26.29	10.56	-168.32	.05	-172.06	.15	-23.55
20	.26	-20.09	10.79	-176.24	.05	-169.91	.12	8.61
50	.25	-25.12	10.79	-162.45	.05	-154.52	.17	18.79
75	.26	-34.69	10.89	-150.84	.06	-139.83	.20	15.63
100	.27	-46.93	10.52	-140.02	.06	-126.88	.22	6.47

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Phase Noise Sample Datasheet

RF AMPLIFIER

MODEL **TM5152PM**

Available as: TM5152PM, 4 Pin TO-8 (T4)
TN5152PM, 4 Pin Surface Mount (SM3)
FP5152PM, 4 Pin Flatpack (FP4)
BX5152PM, Connectorized Housing (H1)

Features

- High Gain: 17 dB Typical
- High Output Power: +20 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	17.0	16.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+17.5 Min.
Reverse Isolation (dB)	-20	-19 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	3.8 Max.
Power Vdc	+15	+15
mA	55	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

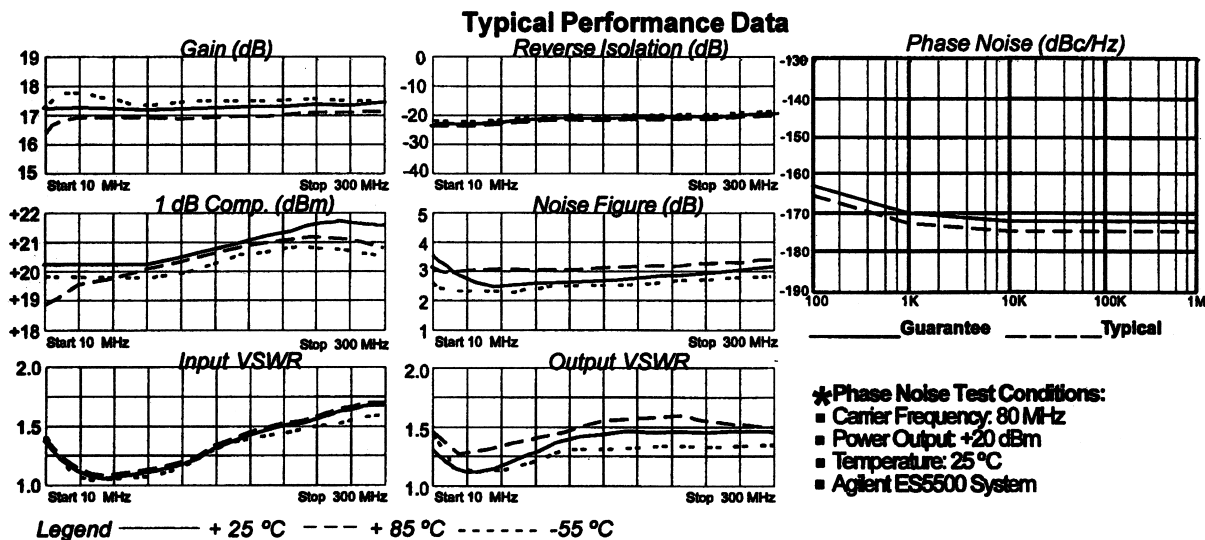
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point	+53 (Typ.)
Second Order Two Tone Intercept Point	+47 (Typ.)
Third Order Two Tone Intercept Point	+33 (Typ.)

**Our unit is optimized for
Low Phase Noise. Other
competitor's units are
not!**

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-166	-164
1 KHz	-172	-170
10 KHz	-174	-172
100 KHz	-174	-172
1 MHz	-174	-172



*Phase Noise Test Conditions:

- Carrier Frequency: 80 MHz
- Power Output: +20 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	-76	6.84	-156	.09	-155	.15	-33
50	.04	-87	7.19	166	.09	163	.08	20
100	.07	-94	7.16	148	.09	145	.12	28
200	.16	-123	7.16	114	.10	108	.18	3
300	.24	-159	7.21	80	.11	75	.18	-30
400	.29	165	7.38	43	.11	41	.16	-82
600	.29	89	7.30	1	.11	5	.19	-161

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Phase Noise Sample Datasheet

RF AMPLIFIER

MODEL TM5138PM

Available as: TM
TN
FP
BX
PN

Even if you are using an Amplifonix custom part, we can optimize it for Superior Phase Noise Performance without changing any of the part's critical parameters.

(SM3)
ing (H1)
e Mount (SM11)

Features

- Superior Phase Noise
- High Output Power: +24.5 dBm Typical
- Low Noise Figure: 2.7 dB Typical
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 150 MHz	5 - 150 MHz
Gain (dB)	15	14 Min.
Power @ 1 dB Comp. (dBm)	+24.5	+22.0 Min.
Reverse Isolation (dB)	-20	-19 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.7	3.5 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

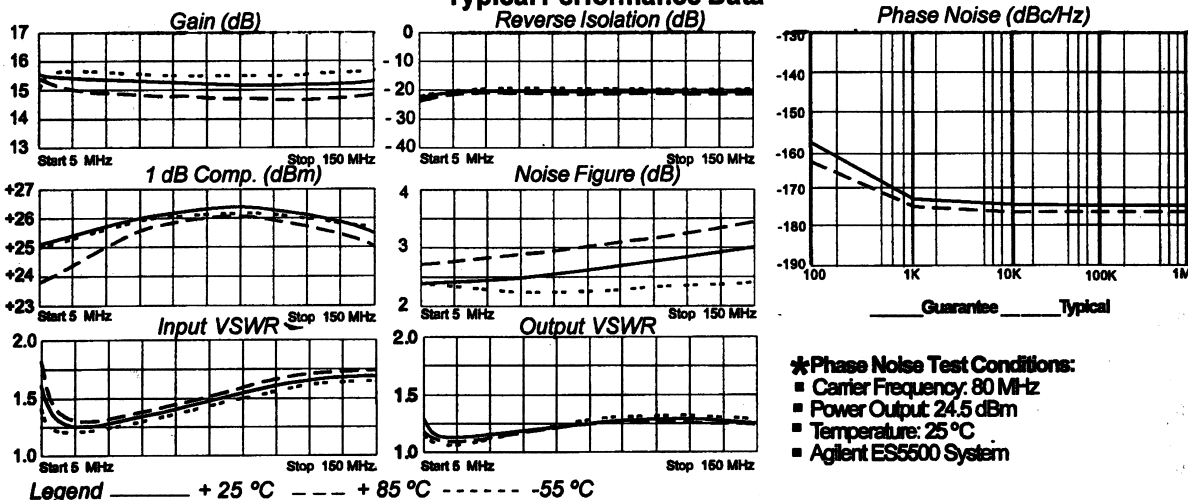
Typical Inter
Second Order
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Third Order Tw
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Ambient Oper
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Case Tempera

at 25 °C
+52 (Typ.)
+46 (Typ.)
+38 (Typ.)
5°C to + 100 °C
2°C to + 125 °C
+ 125 °C
18 dBm
(1 Minute Max.)
Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-158	-154
1 KHz	-163	-160
10 KHz	-176	-174
100 KHz	-176	-174
1 MHz	-176	-174

Typical Performance Data



- *Phase Noise Test Conditions:
- Carrier Frequency: 80 MHz
 - Power Output: 24.5 dBm
 - Temperature: 25 °C
 - Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.22	-92	5.91	-163	.09	-170	.13	-47
25	.11	-116	5.85	168	.10	168	.07	-88
50	.15	-120	5.78	151	.10	151	.09	-124
75	.19	-125	5.72	135	.09	135	.11	-146
100	.23	-130	5.70	119	.09	120	.12	-167
125	.26	-135	5.71	104	.09	105	.12	172
150	.26	-140	5.78	89	.09	90	.11	151

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Application Notes

Definitions

Gain

Gain is the ratio of the power output to the power input of the amplifier in dB. The gain is specified in the linear operating range of the amplifier where a 1 dB increase in input power gives rise to a 1 dB increase in output power. $\text{Gain} = 20 \log(S_{21})$

Noise Figure / Noise Factor

The Noise Factor of a transducer at a specified input frequency is the ratio of (a/b) where "a and b" are;

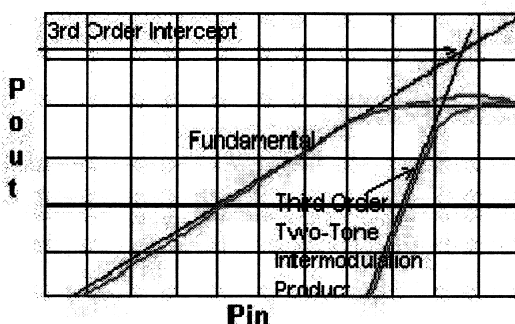
- (a) the available Signal to Noise Ratio (SNR) at the signal generator terminals per unit bandwidth when the temperature of the input termination (generator or source) is 290°K and the bandwidth is limited by the transducer.
- (b) the available SNR per unit bandwidth at the output terminals of the transducer.

Traditionally: Noise Figure NF = $10 \log(\text{noise factor } F)$
Noise Temperature = $T_o(F - 1)$

Where: T_e is the noise temperature
 T_o is standard temperature 290°K
 F is noise factor

Third Order Intercept

The third order intercept is the intercept point formed by the intersection of the fundamental output and the two-tone third order distortion product, when plotted as a theoretical linear function of input power. The higher the Third Order Intercept, the lower the intermods for the incoming signals.



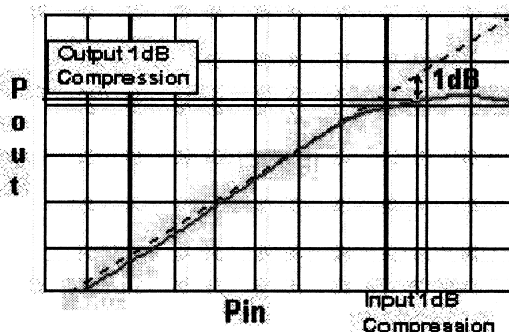
Conversion Loss

The ratio in dB of the IF output of a mixer to the rf input power. All conversion loss measurements and specifications are normally based on the mixer being terminated on all ports and a stated LO signal power level being applied.

Application Notes (continued)

1 dB Compression Point

The 1 dB compression point is the point on a P_{out} vs. P_{in} graph, where an increase in input power causes the measured gain to decrease from the linear gain by one dB. Typical, if not explicitly stated, the 1 dB compression point refers to the output power (P_{out}) at that point.



Dynamic Range

The range, from the minimum, which is at a level 3 dB above the amplifier's internally generated floor, to a maximum input signal level that a component can accept and amplify without distortion.

$$\text{Dynamic Range} = P_{1dB} - P_{mds}$$

Where: P_{mds} = Minimum detectable signal 3 dB above the noise floor.

Spurious Free Dynamic Range

$$\text{Spurious Free Dynamic Range} = 2/3 (P_{toi} - \text{Gain} - P_{mds})$$

Where: P_{1dB} = 1 dB Output Compression Point

P_{toi} = Third Order Intercept

P_{mds} = Minimum detectable signal 3 dB above the noise floor.

Eutectic Bonding

The term for properties of an alloy that have the lowest melting point. In eutectic bonding, the ingredient involved goes from completely molten to solid without going through a slushy phase at the eutectic composition. Eutectic bonding also provides superior heat transfer for active devices.

Pulling

The difference between the maximum and minimum frequency of a VCO when the phase angle of the load reflection coefficient varies through 360 degrees, expressed in MHz, peak to peak.

Pushing

The change in frequency when the supply voltage changes, expressed in MHz/V.

Application Notes (continued)

Isolation

The ratio (expressed in dB) of the power level at one port compared to the resulting power level at another port.

Limiting Level

This is the input power level when the output power goes into compression resulting in a non-linear relationship between P_{out} and P_{in} .

Noise Floor

This is defined as the lowest possible input to a chain or a component, that will produce a detectable output.

Noise Temperature

This is the amount of thermal noise in a chain or a component. Noise Factor and Noise Temperature (T_e) are related as follows;

Noise Temperature (T_e) = $(F - 1)T_o$

Where: T_e is the noise temperature
 T_o is standard temperature 290°K
 F is noise factor

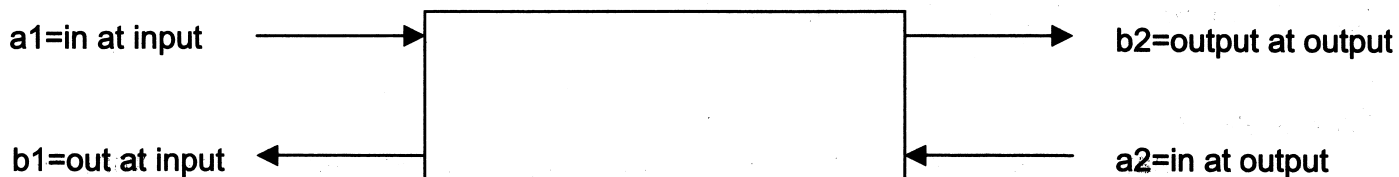
For example, a noise figure of 2.0 dB is equivalent to a Noise Temperature of 170 degrees.

Pin Diode

A diode where a thin layer exists between the N and P regions. Rectification with pin diodes is limited at RF frequencies, they actually behave more like a variable resistor that changes based upon the DC bias current.

Scattering Parameters

Better known as S-Parameters, these 4 values help define the performance of several variables at various frequencies.



S_{11} (Input Reflection Coefficient) = b_1/a_1

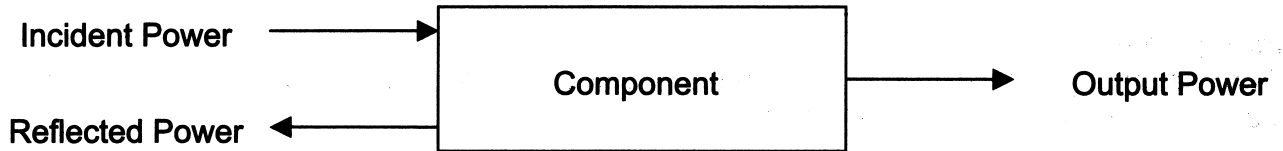
S_{12} (Isolation) = b_1/a_2

S_{21} (Forward Transfer Coefficient or Gain /Loss) = b_2/a_1

S_{22} (Output Reflection Coefficient) = b_2/a_2

Application Notes (continued)

Loss



Insertion Loss (dB) is defined as the drop in power as a signal traverses an RF component. This value not only includes the reflected incoming signal, but also the attenuation of the component.

Return Loss (dB) is defined as a ratio of the incoming signal to the same reflected signal as it enters a component.

$$\text{Insertion Loss} = \frac{\text{Output Power}}{\text{Incident Power}}$$

$$\text{Reflection coefficient} = \frac{\text{Reflected Power}}{\text{Incident Power}}$$

VSWR

Voltage Standing Wave Ratio simply put is the ratio of the maximum to the minimum voltage of a standing wave (which is the instantaneous sum of incident and reflected waves). Ideal is a figure of 1:1 which means that 100% of the incoming signal passed through the component without any reflection. In that case, there would be no "standing wave". A 2:1 VSWR (or mismatch) means that 12% of the incoming signal was reflected.

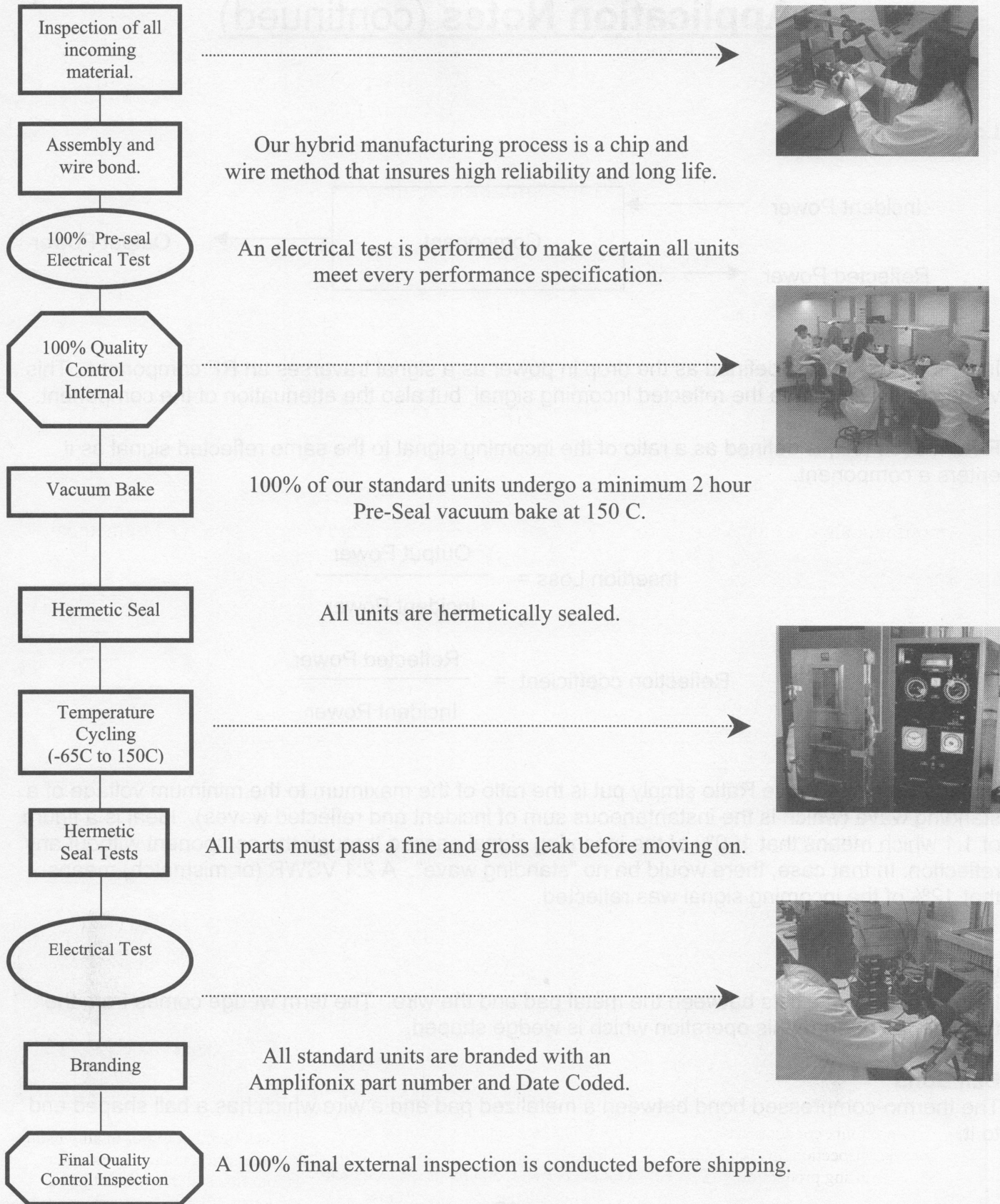
Wedge Bond

It is the bond that exists between the metal pad and the wire. The term wedge comes from the tool used to perform this operation which is wedge shaped.

Ball Bond

The thermo-compressed bond between a metalized pad and a wire which has a ball shaped end to it.

Production Process



Quality Standards and Screening

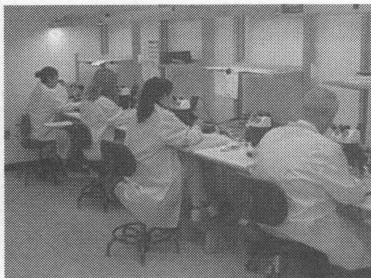
Amplifonix is an ISO 9000 certified company. Amplifonix has the capability to supply units that conform to MIL-PRF-38534 Class H. All screening is performed on site, including Groups A, B C and D.

Environmental Screening

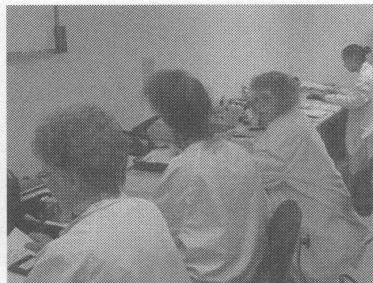
Test	Mil STD 883 Method	Test Conditions/Limits
Internal Visual	2017	-
Stabilization Bake	1008	24 hours @ 150 C
Temperature Cycle	1010	-65 C to 150 C
Constant Acceleration	2001	5000 G y1
Hermetic Seal	1014	A and C
Burn In	1015	168 Hours @85 C
External Visual	2009	-

Amplifonix also conducts testing for qualification and high reliability programs per the test methods of Mil-STD-883 and Mil-STD-202 as shown below.

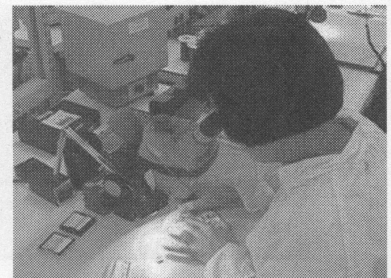
TEST	MIL-STD	Test Method
Thermal Shock	202	107
Mechanical Shock	202	213
Random Vibration	202	214
Sinusoidal Vibration	202	204
External Visual	202	2009
Internal Visual	883	2017
Steady State life	883	1005
Die Shear Strength	883	2019



Amplifonix conducts a 100% internal inspection on all products during production.

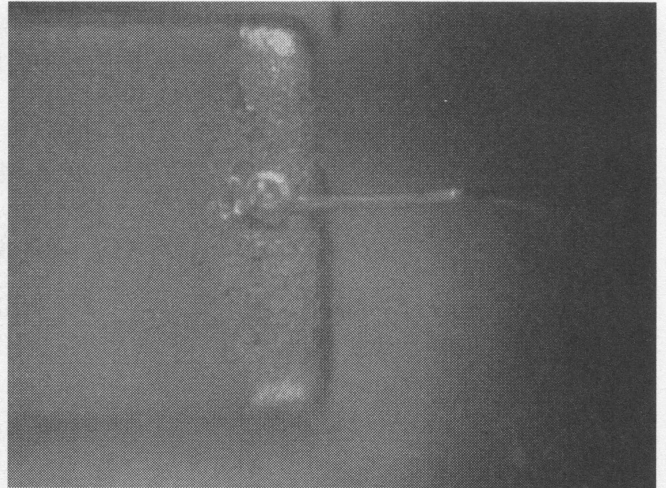
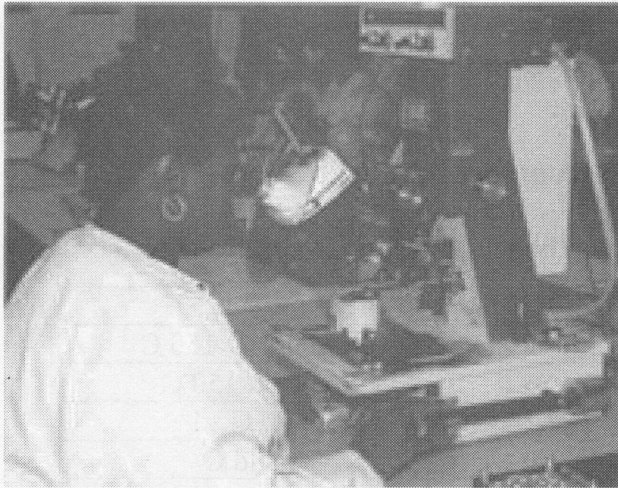


Our quality inspection team inspects all finished products to make certain that the part you ordered is the exact part you ordered. No exceptions.



Each member of our quality team takes pride in their work. Our mission statement is not just a slogan, it's how we work, everyday.

Quality Standards and Screening

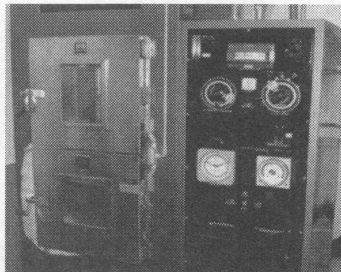


In our hybrid manufacturing process, we incorporate a unique “double ball” bonding process that utilizes an additional ball bond on top of the original bond, insuring the highest reliability.

Other steps we incorporate in our manufacturing process include;



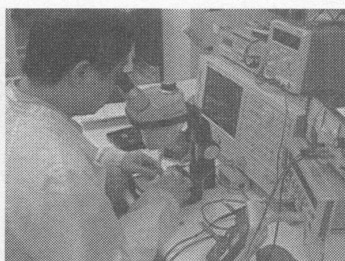
100% Internal Visual Inspection



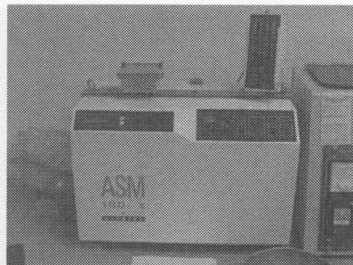
**100% Temperature cycling from
-65 to +150 C for 2.5 hours**



Lead Integrity Testing



100% Final Electrical Testing



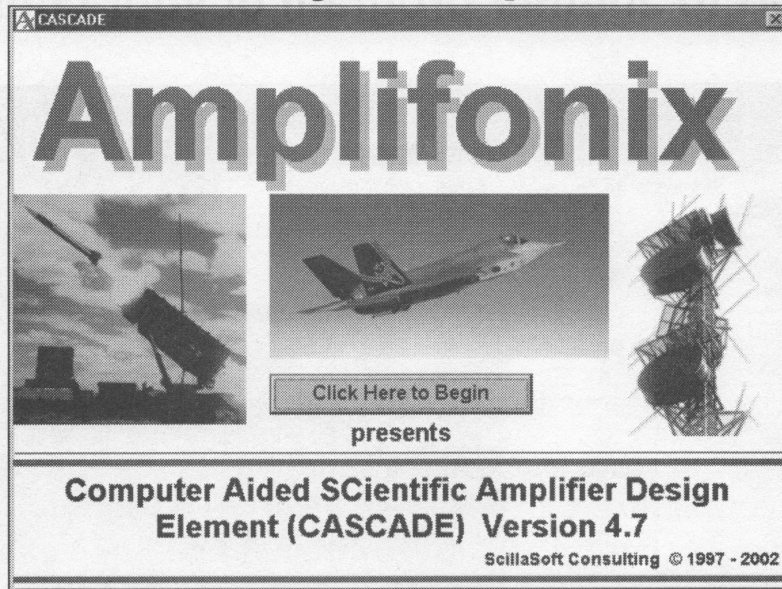
**100% Fine and Gross
Leak Testing**



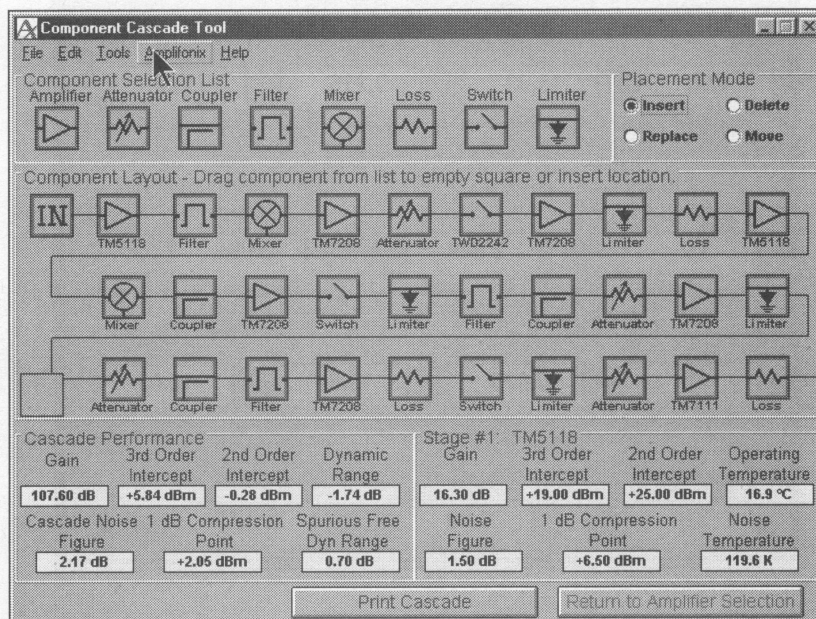
100% Pre-seal Electrical Testing

Cascade Engineering Software Tool

A **FREE** software tool that a Design Engineer can use to analyze component chains.

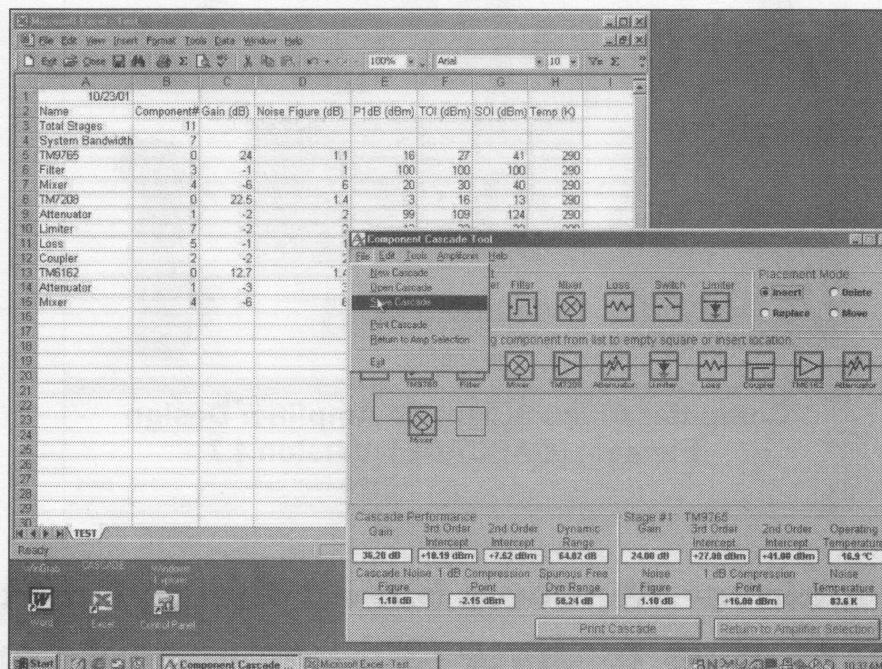


Cascade is a clever Windows based design tool that allows the placement of up to thirty (30) components on a layout area. Enter the individual component's performance parameters and automatically generate an analysis for your cascaded chain.



Cascade Engineering Software Tool

Cascade may even be saved as a spreadsheet file in order to export to another program of your choice.



Cascade even includes a handy RF Conversion Calculator.

The screenshot shows the "Conversions" window, which is divided into four sections: Reflection Conversions, Noise Conversions, Power Conversions, and Temperature Conversions. Each section contains input fields and calculated results.

VSWR	Return Loss (dB)	Reflection Coefficient	Insertion Loss (dB)
1.55	13.32	0.216	0.207

Noise Figure (dB)	Noise Factor	Noise Temperature (deg K)
3.2	2.089	315.9

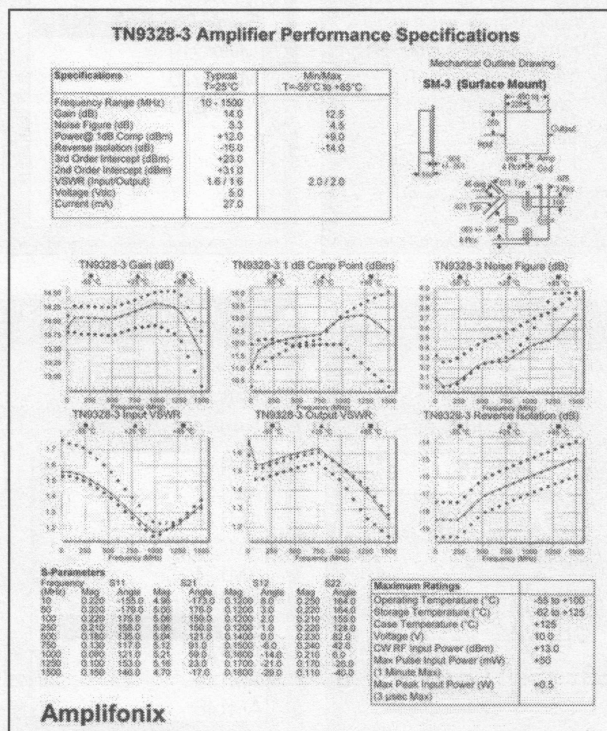
mW	W	dBm	dBW
25	0.025	13.98	-16.02

Fahrenheit	Celsius	Kelvin
32	0.00	273.15

Cascade Engineering Software Tool

In addition to analyzing component chains, Cascade is also a useful search engine for the entire Amplifonix product line. Simply enter the parameters of interest and select the part that best first your parameters.

You may even print out a datasheet of every standard part in our database.



Cascade Engineering Software Tool

Cascade also offers a handy Direct Replacement guide. This search engine allows you to choose from many other manufacturers and hundreds of components. The Amplifonix part is a Direct Replacement Part including package style and pin-outs.

Amplifier Cross-Reference List

Watkins-Johnson Cross-Reference

Watkins-Johnson Model Number	Amplifonix Model Number
A-70-3	TM6575
A-71	
A-72	
A-73	
A-74	
A-74-1	
A-74-2	
A-75	
A-75-2	
A-75-3	

OK

Amplifier Cross-Reference List

Avantek-HP Cross-Reference

Avantek-HP Model Number	Amplifonix Model Number
UTO1005	TM9313
UTO1006	
UTO1007	
UTO1011	
UTO1012	
UTO1013	
UTO1033	
UTO1043	
UTO1502	
UTO1522	

OK

Amplifier Cross-Reference List

Q-Bit Cross-Reference

Q-Bit Model Number	Amplifonix Model Number
QBH110	TM5138
QBH118	
QBH119	
QBH124	
QBH125	
QBH126	
QBH131	
QBH133	
QBH138	
QBH149	

Amplifonix model number may not have equivalent reverse isolation.

OK

Amplifier Cross-Reference List

Motorola Cross-Reference

Motorola Model Number	Amplifonix Model Number
MWA110	CZ8130
MWA120	
MWA130	
MWA210	
MWA220	
MWA230	

OK

Amplifier Cross-Reference List

Cougar Cross-Reference

Cougar Model Number	Amplifonix Model Number
AC548	TM6516
AC555	
AC556	
AC557	
AC558	
AC566	
AC572	
AC575	
AC576	
AC577	

OK

Amplifier Cross-Reference List

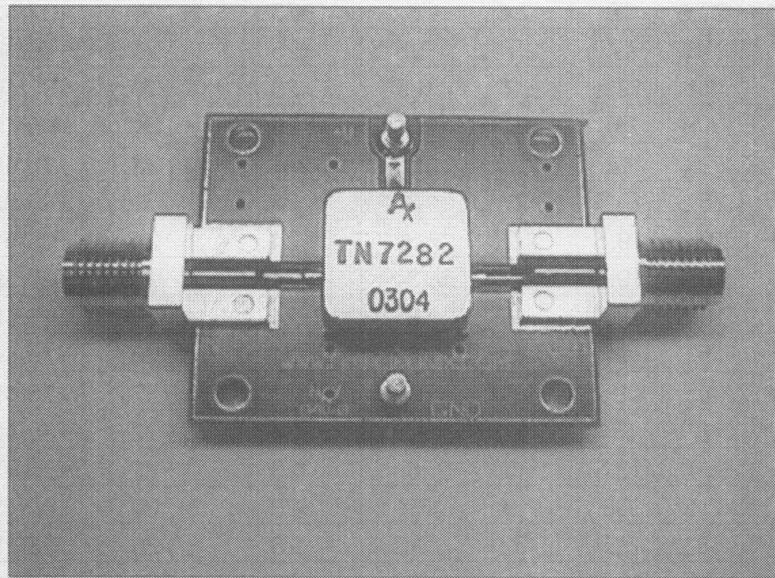
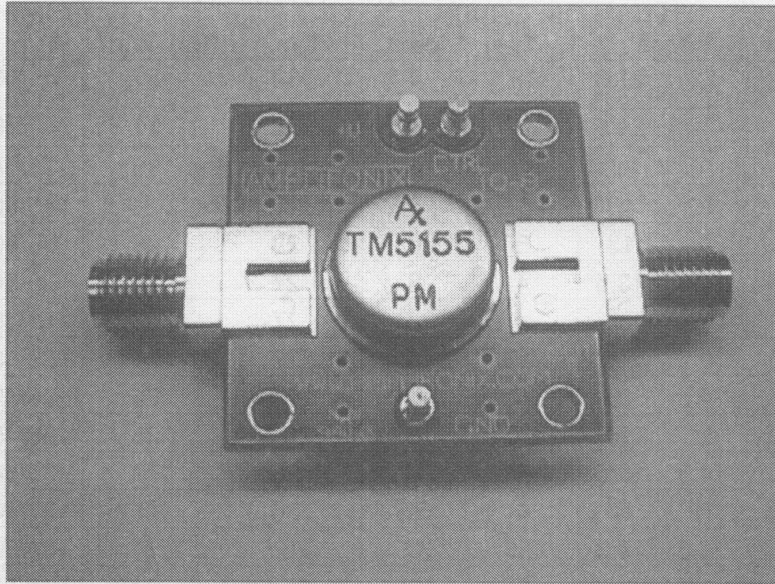
M/A-COM Cross-Reference

M/A-COM Model Number	Amplifonix Model Number
AM112	TM6134
AM117	
AM119	
AMC123	
AM124	
AM131	
AM134	
AM143	
AM145	
AM146	

OK

Component Evaluation Boards

Amplifonix offers evaluation boards with Edge Mount SMA Connectors in order to make testing easier on most of our RF components. These boards are available in three styles; TO-8, TO-8B and Surface Mount (.450" Sq.).



These boards can be used with Amplifonix Amplifiers, VCO's, Limiters, Limiting Amplifiers, Detectors and Voltage Variable Attenuators. In order to prevent thermal runaway, we incorporate heat sink rails. These metal rails should be "properly secured" to insure adequate thermal conduction.

Higher Power Amplifiers

This list contains those Higher Power Amplifiers for use where typical output power must be greater than +20 dBm. Models come in standard T0-8 cans ("TM"), TO-8B ("TR"), Surface Mount ("TN or RN"), Flatpack (FP) and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply (Typ.)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
BXMP1003	5	35	22	21.5	3.7	4	32	31	+49/56	1.5:1	24	425
BXMP1003	0.5	35	22	21.5	3.7	4	32	31	+49/56	1.5:1	24	425
FPMP1002	10	100	10	8.5	5.5	6	30.5	30	+45/54	2.0:1	15	320
TM3035	80	120	16	15	<3.0	5	28.5	27	+45/50	2.0:1	11	200
TM3072	10	200	14	13	5	6	28	26	+45/60	2.0:1	15	185
TM3040	10	250	14.5	13.5	4	6	27	26	+39/54	2.0:1	15	110
TM9723	10	1000	13	12	4	8	27	26	+40/48	2.0:1	15	185
TM9709	10	2000	10.5	8.5	4.5	6	27	26	+39/48	2.0:1	15	180
TM6203	5	500	14.5	13	4	7.5	26.5	25	+36/42	2.0:1	15	125
TM9725	500	2000	11	10	6.5	8	26.5	25	+38/45	2.0:1	15	190
TM6134	20	200	14.3	12.5	4	6	26	23	+39/54	2.5:1	15	90
TM9730	1400	2400	12	10	4	5.5	26	25	+37/46	2.5:1	15	150
TM7194	30	110	20.5	19.8	2.5	3.5	25.5	24	+40/50	2.0:1	15	102
TM3036	25	110	20	19.75	2.5	3.5	25.5	24	+40/50	2.0:1	15	102
TM3020	500	1000	20.5	19	<2.5	3	25	23	+32/42	2.0:1	12	255
TM5338	5	150	15	14	2.7	3.5	25	23	+36/44	2.0:1	12	88
TM6518	5	500	14	12.5	5.2	6.5	25	22.5	+33/40	2.0:1	15	125
TM9715	500	2000	11	10	4.5	6	25	24	+40/49	2.3:1	12	180
TM5138	5	150	15	14	2.7	3.5	24.5	22	+38/46	2.0:1	15	88
TM5125	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	15	80
TM3028	40	100	20.5	19.5	2.2	3	24	23	+38/51	2.0:1	15	82
TM5325	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	12	85
TM7277	5	250	10.5	9.5	4	5	24	20	+41/48	2.0:1	15	70
TM6507	10	500	15.5	14	4	6	24	20	+35/40	2.0:1	15	110
TR9737	100	2000	9.5	8	4.5	6.5	24	22	+38/49	2.0:1	15	140
TM9139	10	2000	8	6	8	9.5	24	22	+35/42	2.0:1	15	90
TM7379	5	200	14	12.5	4.5	6	23	21	+38/47	2.0:1	12	88
TM7370	20	250	8.5	7.3	1.9	3.4	23	20	+40/49	2.0:1	15	45
TM6119	30	250	8	6.5	3	3.5	23	20	+36/45	2.3:1	15	43
TM7279	5	250	14	12.5	4.5	6	23	21	+36/46	2.0:1	15	88
TM5103	5	300	11.5	10	5	6.5	23	21	+36/45	2.0:1	15	85
TM6509	5	500	14.5	13	4.6	6	23	20	+36/50	2.0:1	15	88
TM9705	225	400	15	14	1.5	2	23	22	+34/44	2.0:1	15	90
TM5817	10	1500	14	13	6	7	23	20	+32/44	2.0:1	15	98
TM5137	10	200	12.7	12.2	3.5	4.2	22.5	20.5	+39/53	2.0:1	15	75
TM3033	30	1000	11.5	10	<4.0	6	22	20.5	+36/45	2.0:1	15	90
TM3039	100	220	18	17.5	2.5	3.5	22	19	+38/46	2.0:1	12	80

Datasheets are listed in numerical order starting on page 46.

Higher Power Amplifiers

This list contains those higher power amplifiers for use where output power must be greater than +20 dBm. Models come in standard T0-8 cans ("TM"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.				
TM6212	10	1300	10	8.5	6	8.5	22.5	19.5	+34/42	2.0:1	15	92
TM5136	10	200	20	19	3	4	22	20	+36/46	2.0:1	15	67
TM5155	5	300	15	14	5	6	22	21	+37/48	2.0:1	15	85
TR6535	10	400	32.5	30	1.8	3	22	20	+37/48	2.5:1	15	90
TM6442	20	400	14	12.5	4.5	6	22	19	+37/51	2.0:1	15	62
TR6589	5	500	26.5	25	3.7	5	22	20	+35/55	2.0:1	15	130
TM5102	5	500	12.5	11	5.5	7	22	20	+36/46	2.0:1	15	88
TM6609	5	500	11.5	10	5.5	7	22	20	+36/46	2.0:1	24	88
TM6157	20	500	13	0.5	7.5	8.5	22	18	+33/45	2.0:1	15	75
TM6659	10	700	10.5	9	6.5	8	22	20	+36/46	2.0:1	15	88
TM9319	10	1000	11.5	10	5.5	7.5	22	20	+35/46	2.0:1	15	90
TM9713	500	2000	11	8.5	4.5	6	22	18	+34/44	2.0:1	15	120
TZ9213	5	200	14.5	13	6.8	7.5	22	21	+17/22	2.0:1	15	95
TM7278	5	300	13.5	12.5	4	5.5	21.5	19	+36/49	2.0:1	15	65
TM6191	100	600	23.5	22	2.5	4	21.5	20	+36/52	2.0:1	15	95
TM9740	2000	2500	11	10	4	5.5	21.5	20	+39/51	1.75:1	15	98
TM7282	20	250	23.5	21	4	5	21	18	+34/38	2.3:1	15	45
TM6588	5	450	18.5	17.5	4.5	7	21	19	+35/44	2.0:1	15	80
TM6526	10	500	28	26	3.5	4	21	18.5	+35/50	2.0:1	15	93
TM6582	30	500	23	21.5	3.5	4.5	21	17	+33/43	2.0:1	15	47
TR9604	30	500	23	21	5	6	21	19	+33/40	2.0:1	15	125
TR9169	10	1000	25.5	24	4	5.5	21	19	+33/48	2.0:1	15	125
TM9105	50	1000	11	10.5	4.5	6.5	21	19	+35/45	2.0:1	15	90
TM9119	10	1000	9	7	8.5	11	21	19	+34/40	2.0:1	15	100
TZ9214	5	200	14	12.5	6.5	7.5	21	20	+34/44	2.0:1	15	95
CZ8205	5	200	13.5	12	6	7	21	19	+25/30	2.5:1	15	95
TM7222	20	200	29	27.5	2.9	4	20.5	18	+32/38	2.0:1	15	47
TM6545	10	500	11.5	10	4	5.5	20.5	18	+36/48	2.0:1	15	60
TM9129	10	1500	8	6	8	9.5	20.5	19	+34/42	2.0:1	15	95
CZ8405	5	400	16	14.5	5.5	7	20.5	16	+32/35	2.0:1	15	90
TM7211	30	200	8.5	7.5	1.8	3	20	19	+40/55	2.0:1	15	40
TM5124	20	200	20.5	19.5	2.5	3.5	20	18	+34/44	1.6:1	15	53
TM6121	20	200	10	9.4	2.5	4	20	18	+38/55	2.0:1	15	60
TM6670	10	250	8	6	1.8	3	20	18	+36/46	2.5:1	15	25
TM5152	10	300	17	16	3.5	3.8	20	17.5	+33/47	2.0:1	15	55
TR7217	10	400	25.5	24	2.5	3	20	18	+33/44	2.0:1	15	65
TR7216	10	500	25.5	24	2.5	3	20	18	+33/44	2.0:1	12	65

Low Noise Amplifiers

Low Noise Amplifiers are those where the noise figure is no greater than 4 dB (maximum). All amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX".

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.	Max.	(DC)	Typ. (mA)
TR9771	1200	1700	27	25	<1.0	1.75	14	13	+26/40	2.0:1	15	60
TR9770	1200	1700	27	25	<1.0	1.75	15	14	+26/40	2.0:1	+5	60
TR9770	800	1200	25	25	1	1.75	14	13	+25/40	2.0:1	15	62
TR9770	800	1200	26	24	1	1.75	14	13	+25/40	2.0:1	+5	62
TM7210	10	200	9	8	1.3	2	14	12.5	+31/48	2.0:1	15	15
TM6117	5	250	8.2	7	1.3	2	10	9	+28/43	2.0:1	15	12
TM6162	10	100	12.7	11.5	1.4	2	16	14	+32/46	2.0:1	15	11
TM7111	10	100	12.5	11	1.4	2	17	15.5	+33/47	2.0:1	15	14
TM7208	5	250	22.5	21	1.4	2	3	0	+16/13	2.0:1	15	10
TM7270	10	250	8.3	7	1.4	2.5	13	11	+30/50	1.8:1	15	15
TR9772	1700	1200	23	22	1.5	2.2	15	14	+26/40	2.0:1	15	65
TR9757	1700	1200	23	22	1.5	2.2	15	14	+26/40	2.0:1	+5	60
TM5118	3	100	16.3	15.5	1.5	2	6.5	5.5	+19/25	2.5:1	15	21
TM6118	10	200	10	9.4	1.5	2	18	16.5	+33/55	2.0:1	15	18
TM7271	5	250	18	16	1.5	2.8	0.5	-1	+13/13	2.0:1	15	9
TM7170	10	250	8.5	7.5	1.5	2.5	10	9	+26/38	2.0:1	15	12
TM9705	225	400	15	14	1.5	2	23	22	+34/44	2.0:1	15	90
TM7205	10	200	20	19	1.6	2.2	14	12	+21/26	2.0:1	+5	18
TM6143	5	500	15.7	14.5	1.6	2.5	7.5	5	+20/28	2.5:1	15	15
TM6181	10	400	8.5	7.5	1.7	2.5	8	7	+23/40	2.0:1	15	11
TM6719	5	500	33	31	1.7	2	9	8	+20/36	2.0:1	15	35
TM5107	10	550	15	14	1.75	2.3	2	1	+13/16	2.0:1	15	9
TM7101	10	150	27.5	26	1.8	2.5	16.5	15	+30/35	2.0:1	15	20
TM7211	30	200	8.5	7.5	1.8	3	20	19	+40/55	2.0:1	15	40
TM7371	5	250	18	16	1.8	2.5	2	1	+14/15	2.0:1	15	9
TM7288	5	250	22	21	1.8	2.2	7.5	6.5	+20/23	2.0:1	15	18
TM6670	10	250	8	6	1.8	3	20	18	+36/46	2.5:1	15	25
TR6535	10	400	32.5	30	1.8	3	22	20	+37/48	2.5:1	15	90
TM7104	5	150	24	22.5	1.9	2.5	12	10.5	+25/31	2.0:1	+5	20
TM7370	20	250	8.5	7.3	1.9	3.4	23	20	+40/49	2.0:1	15	45
TM3037	1030	1090	13.5	13	<2.0	2.3	19.5	19	+31/45	2.0:1	+5	78
TM5125	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	15	80
TM5325	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	12	85
TM7102	20	150	24.5	22.5	2	3	17	16	+29/40	2.0:1	15	31
TM6514	30	200	16.5	15	2	3	-2	-3	+11/11	2.0:1	15	8
TM7221	20	200	28.5	27	2	3	18.5	15	+33/38	2.0:1	15	29
TM6683	10	250	34	32.5	2	3	-1	-3	+10/9	2.0:1	5	14
TM5670	20	250	8.2	7	2	3	15.5	13.5	+28/33	2.0:1	5	25

Low Noise Amplifiers

Low Noise Amplifiers are those where the noise figure is no greater than 4 dB (maximum). All amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX".

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply Typ.	
	Low	High	Typ.	Min.	Typ.	Max.	Typ.	(dBm) Min.			(DC)	(mA)
TM3032	100	400	16.5	16	2	3	9.5	8	+22/29	2.0:1	15	16
TM7347	5	300	13.5	12.5	2	3	16	15	+32/44	1.7:1	15	45
TM7207	10	300	18	17	2	3	16	15	+31/42	2.0:1	15	33
TM6457	5	400	15	14	2	3	10	7.5	+24/35	2.0:1	+5	16
TM6210	5	500	15.3	14	2	3	7.5	4.5	+18/26	2.5:1	+5	12
TM5104	10	500	12	10.5	2	3.5	15	13	+32/46	2.0:1	15	35
TM6544	10	500	12	10.5	2	3	15	13	+32/46	2.0:1	15	35
TM3031	100	500	13.5	13	<2.2	2.5	8.5	7	+20/29	2.0:1	+3.3	20
TR3029	100	500	25.5	24	<2.2	2.5	16	14	+27/41	2.0:1	15	45
TM7380	10	200	27.5	26	2.2	3	17	15	+31/35	2.0:1	15	28
TM7381	20	250	24.5	23	2.2	3	14.5	12.5	+27/32	2.0:1	15	18
TM3028	40	100	20.5	19.5	2.2	3	24	23	+38/51	2.0:1	15	82
TR6592	100	500	25.5	24	2.2	2.5	16	14	+27/41	2.0:1	15	45
TM9700	200	2000	12	10.5	2.2	4	19	18	+33/43	2.2:1	+6	65
TM9711	1000	2000	12	10	2.2	3	16	15	+29/35	2.0:1	6	62
CZ8451	5	250	17	15.5	2.2	3	2.5	0	+14/15	2.0:2	5	12.5
TM7103	10	150	26.5	25	2.3	2.8	9.5	8	+23/28	2.0:1	5	16
TM7481	10	300	28	27	2.3	3	16.5	15	+29/33	2.0:1	15	27
TM5519	5	500	15	14	2.3	3	14.5	11.5	+29/39	2.2:1	5	30
TM5119	5	500	15.5	14	2.3	3	16	14	+32/44	2.0:1	15	30
TM6171	5	500	15.2	14	2.3	3	0.5	-2	+12/15	2.0:1	15	11
TM6583	10	500	30	28	2.3	3	-1	-4	+10/13	2.0:1	5	13
TM6675	5	500	20.5	19	2.3	3	5	4	+18/21	2.0:1	15	15
TM9511	5	1000	16.5	15	2.3	3	1	-1	+14/16	2.0:1	15	9.5
TM9311	5	1000	16.5	15	2.3	3	2	-1	+14/17	2.0:1	15	10
TM7281	20	250	25.5	23	2.4	3.3	17.5	15.5	+31/35	2.0:1	15	30
TM6517	5	500	22.5	21	2.4	3	10	8	+22/26	2.0:1	15	22
TM9111	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM9101	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM7194	30	110	20.5	19.8	2.5	3.5	25.5	24	+40/50	2.0:1	15	102
TM7286	10	200	28	26	2.5	3.5	8	7	+20/28	2.0:1	5	21
TM5304	5	200	19.5	18.5	2.5	3	10.5	9.5	+25/33	2.0:1	15	24
TR7215	5	200	31.5	30	2.5	4	13	10	+26/39	1.5:1	15	58
TM5124	20	200	20.5	19.5	2.5	3.5	20	18	+34/44	1.6:1	15	53

Datasheets are listed in numerical order starting on page 46.

Low Noise Amplifiers

This list contains those Low Noise Amplifiers for use where the noise figure (typical) is less than 3.0. Models come in standard T0-8 cans ("TM"), TO-8B ("TR"), Surface Mount ("TN" or "RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	Typ. (mA)
TM9143	10	1000	10.5	9	2.5	4.5	10	8	+27/38	2.0:1	15	25
TM5138	5	150	15	14	2.7	3.5	24.5	22	+38/46	2.0:1	15	88
TM5338	5	150	15	14	2.7	3.5	25	23	+36/44	2.0:1	12	88
TM6121	20	200	10	9.4	2.5	4	20	18	+38/55	2.0:1	15	60
TM7275	5	250	20.5	19	2.5	3.5	9.5	8	+22/27	2.0:1	15	24
TM5150	10	300	20	19	2.5	3.5	18	17	+32/43	2.4:1	15	47
TR7217	10	400	25.5	24	2.5	3	20	18	+33/44	2.0:1	15	65
TM6674	5	500	28	26	2.5	4	-1	-2	+9/17	2.0:1	5	13
TR3032	500	1000	20.5	19	<2.5	3	25	23	+32/42	2.0:1	12	255
TM3039	100	220	18	17.5	2.5	3.5	18	17.7	+38/46	2.0:1	12	80
TM6511	5	500	16.5	15.5	2.5	3	2	1	+14/16	2.0:1	15	10
TM6573	5	500	32	29	2.5	3.5	2	-2.5	+14/19	2.0:1	15	20
TM6501	5	500	16.5	15.5	2.5	3.5	3	1	+15/17	2.0:1	15	10
TM6510	5	500	16.5	15.5	2.5	3.5	3	1	+15/17	2.0:1	15	10
TM6512	5	500	21	19	2.5	3.5	10	8	+21/27	2.0:1	15	23
TM3036	25	110	20.5	19.75	2.5	3.5	25.5	24	+40/50	2.0:1	15	102
TM5110	10	500	15	14	2.5	3	10.5	9	+25/33	2.0:1	15	25
TM6654	5	500	29	27.5	2.5	3	11	10	+23/33	2.0:1	+5	40
TM6543	10	500	11	10	2.5	3	11	9	+24/35	2.0:1	15	25
TM5544	10	500	12.5	11	2.5	3.5	14.5	11.5	+27/33	2.0:1	+5	35
TM6570	10	500	8	7	2.5	3	17.5	17	+35/46	2.0:1	15	35
TR7216	10	500	25.5	24	2.5	3	20	18	+33/44	2.0:1	12	65

Visit our website at
www.amplifonix.com
for a list of our most recent
developments in
Low Noise Figure Amplifier designs.

Higher Gain Amplifiers

Higher Gain Amplifiers are those amps whose gain is at least +20 dB. Amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX".

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TM6683	10	250	34	32.5	2	3	-1	-3	+10/13	2.0:1	5	14
TM6719	5	500	33	31	1.7	2	9	8	+20/36	2.0:1	15	35
TR7215	5	200	31.5	30	2.5	4	13	10	+26/39	1.5:1	15	58
TM7203	5	250	32	30	3	4	8	6.5	+18/30	2.0:1	15	35
TR6535	10	400	32.5	30	1.8	3	22	20	+37/48	2.5:1	15	90
TZ9212	0.1	200	31.5	30	3.5	4	7	5	+17/33	2.0:1	15	35
TZ9203	5	200	31.5	30	3.5	4	7.5	6	+19/35	2.0:1	15	35
CZ8201	5	200	32	30	3.2	4	5.8	3	+16/38	2.0:1	15	30
CZ8206	5	200	32	30	3.5	4	3.5	1	+15/26	2.0:1	12	30
TM7274	5	300	31	29	3	4	9.5	8	+21/32	2.0:1	15	40
TM6573	5	500	32	29	2.5	3.5	2	-2.5	+14/19	2.0:1	15	20
TM6524	5	500	31	29	3.5	4	15	14	+25/30	2.0:1	15	70
TZ9209	5	200	30.5	29	3.5	4	7	5	+18/28	2.0:1	12	36
LN7253	5	200	32	28	3	4	0	-2	+14/23	2.0:1	5	30
TM6583	10	500	30	28	2.3	3	-1	-4	+10/13	2.0:1	5	13
TM6521	5	500	30	28	3	4	9	7	+22/30	2.0:1	15	36
TM7222	20	200	29	27.5	2.9	4	20.5	18	+32/38	2.0:1	15	47
TM7201	5	250	29	27.5	5	6.5	7	5.5	+19/30	2.0:1	15	35
TM6654	5	500	29	27.5	2.5	3	11	10	+23/33	2.0:1	5	40
TZ9210	0.1	200	29	27.5	4.5	6	7	5	+19/33	2.0:1	15	35
TM7221	20	200	28.5	27	2	3	18.5	15	+33/38	2.0:1	15	29
TM7481	10	300	28	27	2.3	3	16.5	15	+29/33	2.0:1	15	27
TM6421	5	400	30	27	3.5	6	9	7	+22/36	2.0:1	15	37
TM6574	5	500	30	27	3.5	6	9	7	+22/36	2.0:1	15	37
CZ8202	5	200	29	27	5.5	6.5	11.5	9.5	+23/34	2.0:1	15	55
TM7101	10	150	27.5	26	1.8	2.5	16.5	15	+30/35	2.0:1	15	20
TM7380	10	200	27.5	26	2.2	3	17	15	+31/35	2.0:1	15	28
TM7286	10	200	28	26	2.5	3.5	8	7	+20/28	2.0:1	5	21
TM7202	5	250	27	26	5	6.5	16.5	15	+29/38	2.0:1	15	88
TM6674	5	500	28	26	2.5	4	-1	-2	+9/17	2.0:1	5	13
TM6526	10	500	28	26	3.5	4	21	18.5	+35/50	2.0:1	15	93
TM6576	5	500	28	26	5	6	16	14	+30/52	2.0:1	15	64
TM9366	10	1000	27.5	25.5	4	5	15	13.5	+25/32	2.0:1	15	63
TR9771	1200	1700	27	25	<1.0	1.75	14	13	+26/40	2.0:1	15	60
TR9770	1200	1700	27	25	<1.0	1.75	15	14	+26/40	2.0:1	+5	60
TM7103	10	150	26.5	25	2.3	2.8	9.5	8	+23/28	2.0:1	5	16
TM6554	5	400	27.5	25	5	6	8	6	+19/32	2.0:1	15	33
TR6589	5	500	26.5	25	3.7	5	22	20	+35/55	2.0:1	15	130
TR9770	800	1200	25	25	1	1.75	14	13	+25/40	2.0:1	15	62
TR9770	800	1200	26	24	1	1.75	14	13	+25/40	2.0:1	+5	62

Higher Gain Amplifiers

Higher Gain Amplifiers are those amps whose gain is at least +20 dB. Amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and SMA Connectorized Housings "BX".

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	Typ. (mA)
TR9169	10	1000	25.5	24	4	5.5	21	19	+33/48	2.0:1	15	125
TR3029	100	500	25.5	24	<2.2	2.5	16	14	+27/41	2.0:1	15	45
CZ8251	5	200	26.5	24	4	4.5	3	-1	+14/27	2.0:1	5	30
TM7381	20	250	24.5	23	2.2	3	14.5	12.5	+27/32	2.0:1	15	18
TM7281	20	250	25.5	23	2.4	3.3	17.5	15.5	+31/35	2.0:1	15	30
TM6523	5	500	25.5	23	5.5	7	16	14	+26/35	2.0:1	15	75
TM7104	5	150	24	22.5	1.9	2.5	12	10.5	+25/31	2.0:1	5	20
TM7102	20	150	24.5	22.5	2	3	17	16	+29/40	2.0:1	15	31
TM5149	5	150	23.5	22.5	3	3.2	18	17	+33/37	2.0:1	15	35
TM6191	100	600	23.5	22	2.5	4	21.5	20	+36/52	2.0:1	15	95
TM9166	10	1200	23.5	22	4.5	5.5	15	13.5	+28/46	2.0:1	15	64
TR9772	1700	1200	23	22	1.5	2.2	15	14	+26/40	2.0:1	15	65
TR9757	1700	1200	23	22	1.5	2.2	15	14	+26/40	2.0:1	+5	60
TM6582	30	500	23	21.5	3.5	4.5	21	17	+33/43	2.0:1	15	47
TM7208	5	250	22.5	21	1.4	2	3	0	+16/13	2.0:1	15	10
TM3042	10	1200	23	21	3	4.5	19	18	+32/40	2.0:1	15	75
TM7288	5	250	22	21	1.8	2.2	7.5	6.5	+20/23	2.0:1	15	18
TM7282	20	250	23.5	21	4	5	21	18	+34/38	2.3:1	15	45
TM6517	5	500	22.5	21	2.4	3	10	8	+22/26	2.0:1	15	22
TM6581	20	500	22	21	3.5	4.5	16	13.5	+28/40	2.0:1	15	27
TR9604	30	500	23	21	5	6	21	19	+33/40	2.0:1	15	125
CZ8050	5	1000	22.5	20.5	6	7	10	6	+23/36	2.0:1	15	67
TM9524	10	1500	22	20	4.3	5	13	10	+ 3/31	2.2:1	15	56
CZ8052	5	1000	21.5	20	6	7	8	6	+20/39	2.0:1	15	60
CZ8653	5	250	22	20	3	3.2	5	2.5	+15/17	2.0:1	15	15

Using Cascade to design your own Higher Gain Amplifier

Cascade, the free software design tool, available at **Amplifonix.com**, will allow you to design your own High Gain Amplifier. Simply type in the desired parameters, and the program will automatically "Cascade" all the amps in its database to give you a selection of the top 10 amps to choose from. It will even allow you to organize the top 10 selections based on Noise, Power or IP3 performance.



Cascade to design you own Higher Gain Amps

Cascade will give you 10 selections from it's standard part database and offer you choices of how to sort them.

The screenshot shows the 'Amplifonix Amplifier Selection Tool' window. It has a menu bar with 'File', 'Edit', 'Components', 'CrossReference', 'Tools', 'Amplifonix', and 'Help'. The main area is divided into several sections:

- Amplifier Selection:** Includes radio buttons for 'Frequency (MHz)', 'Cellular Band', and 'PCS Band'. Below are input fields for 'Gain (dB)' (40), 'Noise Figure (dB)' (4), 'P1dB Comp (dBm)' (18), '3rd Order Int (dBm)', '2nd Order Int (dBm)', 'Reverse Isol (dB)', 'VSWR In/Out', 'DC Voltage (V)' (All V's), and 'DC Current (mA)'.
- Requirements:** A section for specifying design requirements.
- Performance:** A table showing performance metrics for 'Cascade 1'.

Cascade 1	
Low	High
10	500
Min	Typical
Max	43.5
Min	Typical
Max	+18.8
Typical	
+29.9	
Typical	
+41.2	
Max	Typical
In Max	Out Max
2.0:1	2.0:1
Operating	Abs Max
15.0	18.0
Typical	
215.0	
- 10 Cascades Synthesized:** A section for selecting sorting criteria.
 - Sorted by:
 - ☒ Noise figure (low to high)
 - ☐ P1dB (high to low)
 - ☐ Gain (spec and higher)
 - ☐ TOI (high to low)
 - ☐ SOI (high to low)
 - ☐ Part Number
 - ☐ Low Frequency (low to hi)
 - ☐ High Frequency (hi to low)
- Cascade Synthesis:** A section for selecting synthesis criteria.
 - ☒ Show lowest noise figure cascades
 - ☐ Show highest 3rd order int cascades
 - ☐ Show highest 1 dB comp cascades
- Results:** A list of 10 synthesized cascades:
 1. TM6719+TM9709
 2. TM6719+TM6546
 3. TM6719+TM6559
 4. TM6719+TM9319
 5. TM6143+TM6191
 6. TM5107+TM6526
 7. TM6143+TM6526
 8. TM6160+TM9106
- Buttons:** 'Clear Requirements', 'Display Datasheet', and 'Cascade Analysis Tool'.

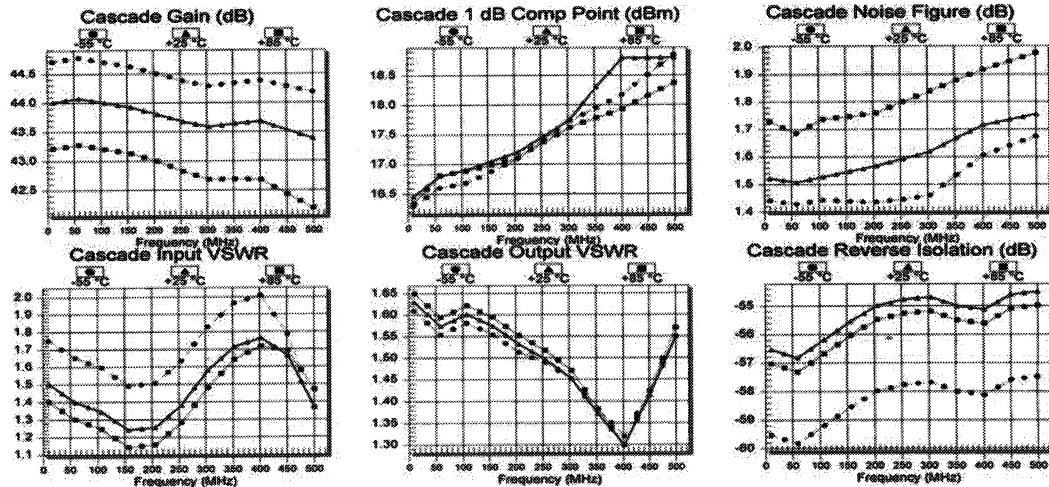
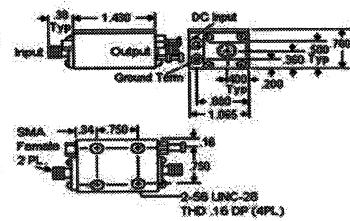
Cascade will allow you to build a cascaded high gain amplifier from our database of over 400 standard parts.

TM6719+TM6659 Typical Performance

Specifications	Typical T=25°C	Min/Max T=-55°C to +85°C
Frequency Range (MHz)	10 - 500	
Gain (dB)	43.4	42.2
Noise Figure (dB)	1.8	2.0
Power@ 1dB Comp (dBm)	+16.5	+16.3
Reverse Isolation (dB)	-54.5	-55.0
3rd Order Intercept (dBm)	+29.4	
2nd Order Intercept (dBm)	+40.2	
VSWR (Input/Output)	1.6 / 1.6	2.0 / 1.6
Voltage (Vdc)	15.0	
Current (mA)	123.0	

Mechanical Outline Drawing

H3 Housing (Two Stages)



S-Parameters

Frequency (MHz)	S11 Mag	S11 Angle	S21 Mag	S21 Angle	S12 Mag	S12 Angle	S22 Mag	S22 Angle
10	0.201	-163.3	168.69	0.0	0.0015	12.9	0.239	-163.2
59	0.167	-165.8	159.86	-28.3	0.0014	-10.0	0.223	-164.8
108	0.147	-165.6	158.48	-51.9	0.0016	0.0	0.231	-165.4
157	0.107	-169.6	157.16	-75.9	0.0017	-4.9	0.223	-173.7
206	0.113	-174.0	154.92	-100.0	0.0018	-7.6	0.210	-177.9
255	0.180	178.2	152.72	-124.5	0.0018	-10.1	0.199	-168.5
304	0.224	170.8	151.13	-149.1	0.0018	-13.0	0.184	-161.2
353	0.263	167.8	152.04	-175.1	0.0018	-20.7	0.157	-175.4
402	0.276	165.7	152.75	-158.9	0.0018	-29.5	0.130	-170.5
451	0.249	-176.1	150.15	131.4	0.0019	-39.4	0.172	-159.3
500	0.156	-158.0	147.63	104.0	0.0019	-41.6	0.216	-148.0

Maximum Ratings

Operating Temperature (°C)	-55 to +100
Storage Temperature (°C)	-62 to +125
Case Temperature (°C)	+125
Voltage (V)	18.0
CW RF Input Power (dBm)	+6.0
Max Pulse Input Power (mW)	+50
(1 Minute Max)	
Max Peak Input Power (W)	+0.5
(3 µsec Max)	

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Bi-Polar Amplifiers

Bipolar Amplifiers are those designs which utilize bi-polar silicon transistors. Amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX". Parts are listed from Low to High Frequency

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply Typ.	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TM6162	10	100	12.7	11.5	1.4	2	16	14	+32/46	2.0:1	15	11
TM7111	10	100	12.5	11	1.4	2	17	15.5	+33/47	2.0:1	15	14
TM5118	3	100	16.3	15.5	1.5	2	6.5	5.5	+19/25	2.5:1	15	21
TM5125	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	15	80
TM5325	10	100	20.5	19.5	2	3	24	22.5	+40/52	2.2:1	12	85
TM7194	30	110	20.5	19.8	2.5	3.5	25.5	24	+40/50	2.0:1	15	102
TM5834	10	100	19.7	18.7	3.5	4.5	27.5	26	+40/52	2.0:1	15	135
TM7101	10	150	27.5	26	1.8	2.5	16.5	15	+30/35	2.0:1	15	20
TM7104	5	150	24	22.5	1.9	2.5	12	10.5	+25/31	2.0:1	5	20
TM7102	20	150	24.5	22.5	2	3	17	16	+29/40	2.0:1	15	31
TM7103	10	150	26.5	25	2.3	2.8	9.5	8	+23/28	2.0:1	5	16
TM5138	5	150	15	14	2.7	3.5	24.5	22	+38/46	2.0:1	15	88
TM5338	5	150	15	14	2.7	3.5	25	23	+36/44	2.0:1	12	88
TM5149	5	150	23.5	22.5	3	3.2	18	17	+33/37	2.0:1	15	35
LN7253	5	200	32	28	3	4	0	-2	+14/23	2.0:1	5	30
TM7210	10	200	9	8	1.3	2	14	12.5	+31/48	2.0:1	15	15
TM6118	10	200	10	9.4	1.5	2	18	16.5	+33/55	2.0:1	15	18
TM7205	10	200	20	19	1.6	2.2	14	12	+21/26	2.0:1	5	18
TM7211	30	200	8.5	7.5	1.8	3	20	19	+32/44	2.0:1	15	40
TM6514	30	200	16.5	15	2	3	-2	-3	+11/11	2.0:1	15	8
TM7221	20	200	28.5	27	2	3	18.5	15	+33/38	2.0:1	15	29
TM7380	10	200	27.5	26	2.2	3	17	15	+31/35	2.0:1	15	28
TM7286	10	200	28	26	2.5	3.5	8	7	+20/28	2.0:1	5	21
TM5304	5	200	19.5	18.5	2.5	3	10.5	9.5	+25/33	2.0:1	15	24
TR7215	5	200	31.5	30	2.5	4	13	10	+26/39	1.5:1	15	58
TM5124	20	200	20.5	19.5	2.5	3.5	20	18	+34/44	1.6:1	15	53
TM6121	20	200	10	9.4	2.5	4	20	18	+38/55	2.0:1	15	60
TM7222	20	200	29	27.5	2.9	4	20.5	18	+32/38	2.0:1	15	47
TM5136	10	200	20	19	3	4	22	20	+36/46	2.0:1	15	67
TM7272	10	200	14.7	14	3	5	14	12	+29/41	1.3:1	5	35
TM5137	10	200	12.7	12.2	3.5	4.2	22.5	20.5	+39/53	2.0:1	15	75
TM6134	20	200	14.3	12.5	4	6	26	23	+39/54	2.5:1	15	90
TM7379	5	200	14	12.5	4.5	6	23	21	+38/47	2.0:1	12	88
TM6117	5	250	8.2	7	1.3	2	10	9	+28/43	2.0:1	15	12
TM7208	5	250	22.5	21	1.4	2	3	0	+16/13	2.0:1	15	10
TM7270	10	250	8.3	7	1.4	2.5	13	11	+30/50	1.8:1	15	15
TM7271	5	250	18	16	1.5	2.8	0.5	-1	+13/13	2.0:1	15	9
TM7170	10	250	8.5	7.5	1.5	2.5	10	9	+26/28	2.0:1	15	12

Bipolar Amplifiers

Bipolar Amplifiers are those designs which utilize bi-polar silicon transistors. All amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX". Parts are listed from Low to High Frequency.

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TM7208	5	250	22.5	21.0	1.4	2.0	+ 3.0	0.0	+16/13	2.0:1	+15	10
TM7270	10	250	8.3	7.0	1.4	2.5	+13.0	+11.0	+30/50	1.8:1	+15	15
TM7271	5	250	18.0	16.0	1.5	2.8	+ 0.5	- 1.0	+13/13	2.0:1	+15	9
TM7170	10	250	8.5	7.5	1.5	2.5	+10.0	+ 9.0	+26/38	2.0:1	+15	12
TM7371	5	250	18.0	16.0	1.8	2.5	+ 2.0	+ 1.0	+14/15	2.0:1	+15	9
TM7288	5	250	22.0	21.0	1.8	2.2	+ 7.5	+ 6.5	+20/23	2.0:1	+15	18
TM6670	10	250	8.0	6.0	1.8	3.0	+20.0	+18.0	+36/46	2.5:1	+15	25
TM7370	20	250	8.5	7.3	1.9	3.4	+23.0	+20.0	+40/49	2.0:1	+15	45
TM6683	10	250	34.0	32.5	2.0	3.0	- 1.0	- 3.0	+10/ 9	2.0:1	+ 5	14
TM5670	20	250	8.2	7.0	2.0	3.0	+15.5	+13.5	+28/33	2.0:1	+ 5	25
TM7381	20	250	24.5	23.0	2.2	3.0	+14.5	+12.5	+27/32	2.0:1	+15	18
TM7281	20	250	25.5	23.0	2.4	3.3	+17.5	+15.5	+31/35	2.0:1	+15	30
TM7275	5	250	20.5	19.0	2.5	3.5	+ 9.5	+ 8.0	+22/27	2.0:1	+15	24
TM7203	5	250	32.0	30.0	3.0	4.0	+ 8.0	+ 6.5	+18/30	2.0:1	+15	35
TM6119	30	250	8.0	6.5	3.0	3.5	+23.0	+20.0	+36/45	2.3:1	+15	43
TM7382	20	250	18.0	16.0	4.0	5.0	+17.5	+16.0	+29/31	2.0:1	+15	45
TM7282	20	250	23.5	21.0	4.0	5.0	+21.0	+18.0	+34/38	2.3:1	+15	45
TM7277	5	250	10.5	9.5	4.0	5.0	+24.0	+20.0	+41/48	2.0:1	+15	70
TM7279	5	250	14.0	12.5	4.5	6.0	+23.0	+21.0	+36/46	2.0:1	+15	88
TM7201	5	250	29.0	27.5	5.0	6.5	+ 7.0	+ 5.5	+19/30	2.0:1	+15	35
TM7347	5	300	13.5	12.5	2.0	3.0	+16.0	+15.0	+32/44	1.7:1	+15	45
TM7207	10	300	18.0	17.0	2.0	3.0	+16.0	+15.0	+31/42	2.0:1	+15	33
TM7481	10	300	28.0	27.0	2.3	3.0	+16.5	+15.0	+29/33	2.0:1	+15	27
TM5150	10	300	20.0	19.0	2.5	3.5	+18.0	+17.0	+32/43	2.4:1	+15	47
TM5105	5	300	12.0	11.0	2.8	4.0	+ 7.0	+ 5.5	+21/29	2.0:1	+15	17
TM7287	10	300	15.5	14.5	2.8	4.0	+10.0	+ 9.0	+24/33	2.0:1	+ 5	15
TM7487	10	300	15.5	14.5	3.0	4.0	+ 8.0	+ 7.0	+22/31	2.0:1	+ 5	13
TM7274	5	300	31.0	29.0	3.0	4.0	+ 9.5	+ 8.0	+21/32	2.0:1	+15	40
TM5152	10	300	17.0	16.0	3.5	3.8	+20.0	+17.5	+33/47	2.0:1	+15	55
TM7278	5	300	13.5	12.5	4.0	5.5	+21.5	+19.0	+36/49	2.0:1	+15	65
TM7297	20	300	10.5	9.5	4.5	6.0	+16.5	+15.0	+29/33	2.0:1	+ 5	43
TM5155	5	300	15.0	14.0	5.0	6.0	+22.0	+21.0	+37/48	2.0:1	+15	85
TM5103	5	300	11.5	10	5	6.5	23.0	21.0	+36/45	2.0:1	15	85
TM6181	10	400	8.5	7.5	1.7	2.5	+ 8.0	+ 7.0	+23/40	2.0:1	+15	11
TR6535	10	400	32.5	30.0	1.8	3.0	+22.0	+20.0	+37/48	2.5:1	+15	90
TM6457	5	400	15.0	14.0	2.0	3.0	+10.0	+ 7.5	+24/35	2.0:1	+ 5	16
TR7217	10	400	25.5	24.0	2.5	3.0	+20.0	+18.0	+33/44	2.0:1	+15	65
TM6487	10	400	15.5	14.0	3.2	5.0	+17.5	+15.0	+32/45	2.0:1	+15	33
TM6443	10	400	13.2	12.0	3.5	5.0	+ 6.5	+ 5.0	+19/27	2.0:1	+ 5	10
TM6421	5	400	30.0	27.0	3.5	6.0	+ 9.0	+ 7.0	+22/36	2.0:1	+15	37

Bi-Polar Amplifiers

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Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.		(DC)	(mA)
TM6441	20	400	14.5	13	3.5	5	16	15	+31/48	2.0:1	15	32
TM6440	10	400	13	12	3.6	5	+ 9.0	+ 7.5	+23/33	2.0:1	15	15
TM5441	10	400	14.5	13	3.8	4.5	- 1.0	- 4.0	+25/33	2.0:1	+ 5	33
TM6444	10	400	13	12	4	5.5	11	+ 9.0	+25/37	2.0:1	+ 5	15
TM6587	10	400	13	12	4	5	17	16	+32/47	2.0:1	15	32
TM6442	20	400	14	12.5	4.5	6	22	19	+37/51	2.0:1	15	62
TM6588	5	450	18.5	17.5	4.5	7	21	19	+35/44	2.0:1	15	80
TM6554	5	450	27.5	25	5	6.0	8	6.0	+19/32	2.0:1	15	33
TM6556	5	400	26	24	4.5	6.5	14.0	12.5	+28/47	2.0:1	15	66
TM6143	5	500	15.7	14.5	1.6	2.5	+ 7.5	+ 5.0	+20/28	2.5:1	15	15
TM6719	5	500	33	31	1.7	2	+ 9.0	8	+20/36	2.0:1	15	35
TM6210	5	500	15.3	14	2	3	+ 7.5	4.5	+18/26	2.5:1	+ 5	12
TM5104	10	500	12	10.5	2	3.5	15	13	+32/46	2.0:1	15	35
TM6544	10	500	12	10.5	2	3	15	13	+32/46	2.0:1	15	35
TR6592	100	500	25.5	24	2.2	2.5	16	14	+27/41	2.0:1	15	45
TM5519	5	500	15	14	2.3	3	14.5	11.5	29/39	2.2:1	+ 5	30
TM5119	5	500	15.5	14	2.3	3	16	14	+32/44	2.0:1	15	30
TM6171	5	500	15.2	14	2.3	3	+ 0.5	- 2.0	+12/15	2.0:1	15	11
TM6583	10	500	30	28	2.3	3	- 1.0	- 4.0	+10/13	2.0:1	+ 5	13
TM6675	5	500	20.5	19	2.3	3	+ 5.0	+ 4.0	+18/25	2.0:1	15	15
TM6517	5	500	22.5	21	2.4	3	10	+ 8.0	+22/26	2.0:1	15	22
TM6674	5	500	28	26	2.5	4	- 1.0	- 2.0	+9/17	2.0:1	+ 5	13
TM6511	5	500	16.5	15.5	2.5	3	+ 2.0	+ 1.0	+14/16	2.0:1	15	10
TM6573	5	500	32	29	2.5	3.5	+ 2.0	-2.5	+14/19	2.0:1	15	20
TM6501	5	500	16.5	15.5	2.5	3.5	+ 3.0	+ 1.0	+15/17	2.0:1	15	10
TM6510	5	500	16.5	15.5	2.5	3.5	+ 3.0	+ 1.0	+15/17	2.0:1	15	10
TM6512	5	500	21	19	2.5	3.5	10	+ 8.0	+21/27	2.0:1	15	23
TM5110	10	500	15	14	2.5	3	10.5	+ 9.0	+25/33	2.0:1	15	25
TM6654	5	500	29	27.5	2.5	3	11	10	+23/33	2.0:1	+ 5	40
TM6543	10	500	11	10	2.5	3	11	+ 9.0	+24/35	2.0:1	15	25
TM5544	10	500	12.5	11	2.5	3.5	14.5	11.5	+27/33	2.0:1	+ 5	35
TM6570	10	500	8	7	2.5	3	17.5	17	+35/46	2.0:1	15	35
TR7216	10	500	25.5	24	2.5	3	20	18	+33/44	2.0:1	12	65
TM6575	5	500	21	19	2.7	3.5	9.5	8.5	+21/28	2.0:1	15	23
TM5101	5	500	13	12	2.8	4	7.5	6	+21/31	2.0:1	15	17
TM6521	5	500	30	28	3	4	9	7	+22/30	2.0:1	15	36
TM6681	20	500	17.5	15.5	3	4	9.5	7	+23/28	2.0:1	15	29
TM5126	5	500	15	14	3	3.5	17	16	+16/21	2.0:1	15	50
TM5175	20	500	16.3	15.5	3	3.8	18	16.5	+32/41	2.0:1	15	45
TM6547	10	500	12.5	11	3	4	19	17.5	+35/48	2.0:1	15	55
TM6147	5	500	17	16	3	4.5	20	17.5	+35/44	2.0:1	15	50

BiPolar Amplifiers

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Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TR6689	10	500	30	28	3.2	4	21.5	20	+34/44	2.0:1	15	130
TM6503	5	500	16.5	15.5	3.5	4.5	1.5	0	+14/16	2.0:1	15	10
TM6574	5	500	30	27	3.5	6	9	7	+22/36	2.0:1	15	37
TM6520	5	500	14.5	13.5	3.5	4.5	13	11.5	+27/34	2.0:1	5	33
TM6416	5	500	15	14	3.5	4.5	13.5	12	+27/35	2.0:1	15	35
TM6524	5	500	31	29	3.5	4	15	14	+25/30	2.0:1	15	70
TM6581	20	500	22	21	3.5	4.5	16	13.5	+28/40	2.0:1	15	27
TM6533	5	500	16.5	15	3.5	5.5	17	15	+32/42	2.0:1	15	50
TM6577	5	500	16.5	15	3.5	5.5	17	15	+32/42	2.0:1	15	50
TM6526	10	500	28	26	3.5	4	21	18.5	+35/50	2.0:1	15	93
TM6582	30	500	23	21.5	3.5	4.5	21	17	+33/43	2.0:1	15	47
TM6513	5	500	17	15.5	3.7	5	16.5	15	+29/41	2.0:1	24	50
TR6589	5	500	26.5	25	3.7	5	22	20	+35/55	2.0:1	15	130
TM6505	5	500	15	14	4	5	10	8.5	+23/33	2.0:1	15	24
TM6555	5	500	14.7	13.5	4	6.5	11.5	9	+24/35	2.0:1	15	33
TM5109	10	500	10.5	9.5	4	5	13	12	+28/40	2.0:1	15	35
TM6672	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	9	30
TM6516	5	500	14.5	13.5	4	4.5	14	12	+28/38	2.0:1	15	35
TM6572	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	5	30
TM6547	10	500	12.5	11	4	4.5	19	17.5	+35/48	2.0:1	15	55
TM6545	10	500	11.5	10	4	5.5	20.5	18	+36/48	2.0:1	15	60
TM6519	5	500	14.3	12	4.2	5.5	19	17	+34/40	2.0:1	15	70
TM6507	10	500	15.5	14	4	6	24	20	+35/40	2.0:1	15	110
TM6557	10	500	15	13.5	4.5	6.5	15.5	14	+30/38	2.0:1	15	44
TM6515	5	500	12.5	11	4.5	5.5	16.5	15	+31/43	2.0:1	15	50
TM6131	10	500	10.3	9	4.5	6.5	20	18	+37/50	2.0:1	15	62
TM6509	5	500	14.5	13	4.6	6	23	20	+36/50	2.0:1	15	88
TM6558	5	500	12	10.5	4.8	6.5	19	17.5	+36/48	2.0:1	15	65
TM6607	5	500	15	14	5	6	14.5	12.5	+24/34	2.0:1	24	50
TM6149	5	500	15.3	14.5	5	6	16	14.5	+30/41	2.0:1	15	45
TM6576	5	500	28	26	5	6	16	14	+30/52	2.0:1	15	64
TR9604	30	500	23	21	5	6	21	19	+33/40	2.0:1	15	125
TM6518	5	500	14	12.5	5.2	6.5	25	22.5	+33/40	2.0:1	15	125
TM6603	5	500	10	8.5	5.5	7	15.5	14	+30/42	2.0:1	24	50
TM6523	5	500	25.5	23	5.5	7	16	14	+26/35	2.0:1	15	75
TM6519	10	500	14.3	12	5.5	6	19	17	+34/40	2.0:1	15	70
TM5102	5	500	12.5	11	5.5	7	22	20	+36/46	2.0:1	15	88
TM6559	5	500	11.5	10	5.5	7	22	20	+36/46	2.0:1	15	88
TM6705	5	500	10.5	9	6	7.5	20	18	+34/44	2.0:1	15	90
TM6157	20	500	13	0.5	7.5	8.5	22	18	+33/45	2.0:1	15	75
TM5133	10	500	10	9	3.3	4.5	16	14.5	+30/45	2.0:1	15	57
TM5107	10	550	15	14	1.75	2.3	2	1	+13/16	2.0:1	15	9

Bipolar Amplifiers

Bipolar Amplifiers are those designs which utilize bi-polar silicon transistors. All amplifiers are available in TO-8 cans "TM" and Surface Mount Packages "TN" for TO-8's (.450" Sq.).

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.		(DC)	(mA)
TM6191	100	600	23.5	22	2.5	4	21.5	20	+36/52	2.0:1	15	95
TM6605	10	600	15.5	14	3	4.5	10	8	+23/32	2.0:1	15	24
TM6667	5	600	14	12.5	4	5.5	15	14	+30/45	2.0:1	15	33
TM6659	10	700	10.5	9	6.5	8	22	20	+36/46	2.0:1	15	88
TM9167	10	800	12.5	11.5	4.5	5.5	15.5	14.5	+30/45	2.0:1	15	32
TM9118	10	800	14.7	13.5	4.5	5.5	16	15	+26/33	2.0:1	15	45
TM9511	5	1000	16.5	15	2.3	3	1	-1	+14/16	2.0:1	15	9.5
TM9311	5	1000	16.5	15	2.3	3	2	-1	+14/17	2.0:1	15	10
TM9111	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM9101	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM9163	5	1000	16	15	2.5	3.5	5	3	+16/21	2.0:1	15	14
TM9143	10	1000	10.5	9	2.5	4.5	10	8	+27/38	2.0:1	15	25
TM9566	10	1000	26	24.5	3	4	0.1	-0.5	+12/21	2.0:1	15	18
TM9363	5	1000	16.5	15	3	4	6	4	+19/25	2.0:1	15	16
TM9312	5	1000	16.5	15	3	4	7	5	+20/24	2.0:1	15	18
TM9102	5	1000	15	13.5	3	4.5	10	7.5	+23/32	2.0:1	15	23
TM6145	10	1000	10.7	10	3	5	19	16	+35/46	3.0:1	15	50
TM9313	5	1000	16	15	3.5	4.5	12	10	+23/35	2.0:1	15	29
TM9318	10	1000	14.7	13.5	3.7	5.5	16	14.5	+30/42	2.0:1	15	47
TM9107	5	1000	13.5	11.5	3.9	5	13	10	+22/26	2.0:1	5	33
TM9115	5	1000	14.5	13	4	5.5	9.5	8	+23/32	2.0:1	15	24
TM6176	5	1000	13.5	12	4	5	14	12	+27/40	2.0:1	15	38
TM9366	10	1000	27.5	25.5	4	5	15	13.5	+25/32	2.0:1	15	63
TM9117	10	1000	12	10	4	6	15.5	14.5	+28/40	2.0:1	15	46
TM9518	10	1000	14.7	13.5	4	5.5	16	14.5	+29/41	2.0:1	15	44
TM9196	500	1000	11.5	13.5	4	4.5	18	16	+29/48	3.0:1	15	40
TM6155	300	1000	12.5	10.5	4	5.5	19.5	18	+33/45	3.0:1	15	50
TM9165	10	1000	10.5	9	4.5	6	11	9	+24/37	2.0:1	15	30
TM9157	1	1000	10.2	8.5	4.5	6	14	13	+27/37	2.0:1	15	44
TM9106	5	1000	12	10.5	4.8	6	19	16	+27/32	2.0:1	15	70
TM9333	5	1000	11.5	10	5	6.5	16	14	+30/44	2.0:1	15	48
TM6345	10	1100	12.3	10.5	3	4	17	15	+33/46	3.0:1	15	45
TM5147	20	1100	14	13	3.5	4	11	9	+23/33	2.0:1	15	27
TM9316	10	1200	13	12	3	4	6	4.5	+19/28	2.0:1	5	15
TM9193	400	1200	15	14	3	4	9	8.5	+14/20	2.0:1	15	19
TM9164	10	1200	26	24	3.6	4.5	8.5	6.5	+20/33	2.0:1	15	35
TM9166	10	1200	23.5	22	4.5	5.5	15	13.5	+28/46	2.0:1	15	64
TM5131	5	1300	18	17	5	5.5	7.5	6	+20/40	2.0:1	15	40
TM9328	10	1500	14	12.5	3.2	4.5	12	9	+23/31	2.0:1	5	27
TM9325	10	1500	14	13	3.5	4.5	9	7.5	+22/30	2.0:1	15	24
TM9123	10	1500	12	10	4	4.5	4	3	+17/22	2.0:1	15	14
TM9114	10	1500	20	18	4	5.5	7	5	+21/42	2.0:1	12	34

Bipolar Amplifiers

Bipolar Amplifiers are those designs which utilize bi-polar silicon transistors. All amplifiers are available in TO-8 cans "TM", TO-8B cans "TR", Surface Mount Packages "TN" for TO-8's (.450" Sq.), "RN" for slightly larger TO-8B's (.525" Sq.), and Connectorized Housings "BX". Parts are listed from Low to High Frequency.

Model	Frequency Range		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TM9124	10	1500	20	18	4	5.5	8	6	+21/42	2.0:1	15	34
TM9502	5	1500	10.5	8.5	4	5.5	9	7	+24/32	2.0:1	15	23
TM9121	10	1500	15	13.5	4	5	13.5	12	+26/34	2.0:1	15	34
TM9524	10	1500	22	20	4.3	5	13	10	+23/31	2.2:1	15	56
TM9125	10	1500	10.5	9	4.5	6	8	7	+21/33	2.0:1	15	24
TM9128	10	1500	11.5	10	4.5	6	15	13.5	+29/43	2.0:1	15	40
TM9522	5	1500	20.5	18.5	5	6	14	10	+25/42	2.0:1	15	64
TM9529	10	1600	9	7.5	6.5	8	19	18	+29/35	2.0:1	12	90
TM9331	10	2000	11.5	10.5	4	4.5	2	0	+14/21	2.0:1	15	11
TM9355	5	2000	10	9	4	6.5	12	10	+24/32	2.0:1	+5	30
TM9133	10	2000	9.5	8	4.5	5.5	3	2	+16/23	2.0:1	15	14
TM9134	100	2000	16.5	14	4.5	6	6	3	+16/33	2.0:1	15	35
TM9324	10	2000	16	14	4.7	6	6.5	4.5	+19/37	2.0:1	15	38
TM9322	10	2000	10	8.5	5	6.5	9	7.5	+23/35	2.0:1	15	25
TM9135	10	2000	10	8.5	5	6.5	9	7.5	+23/35	2.0:1	15	25
FP9130	200	2000	23.5	22	5	6.5	15	13.5	+27/40	2.0:1	15	90
TM9436	10	2000	17	15	5.5	7.5	11	10	+21/27	1.5:1	12	63
TM9136	10	2000	17	15	5.5	7.5	12	11	+22/28	2.0:1	15	63
TM9323	10	2000	8.5	7.5	5.5	7.5	15	14	+30/50	2.0:1	15	50
TM9138	10	2000	7.5	6	6	9.5	19	16.5	+33/46	2.2:1	15	65
TM9137	10	2000	9.5	7	6.5	10	15.5	13	+28/38	2.2:1	15	45
TM9327	10	2000	15	13	6.5	7.5	17.5	16	+29/38	2.0:1	15	108

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Lower Power Amplifiers

This list contains those Lower Power Amplifiers (less than +20 dBm) for use where parameters other than High Power are important. Models come in standard T0-8 cans ("TM"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			(DC)	(mA)
TM9702	500	1500	12	10.5	2.8	4	19.8	19	+31/40	2.0:1	8	107
TM6155	300	1000	12.5	10.5	4	5.5	19.5	18	+33/45	3.0:1	15	50
TM6547	10	500	12.5	11	3	4	19	17.5	+35/48	2.0:1	15	55
TM6547	10	500	12.5	11	4	4.5	19	17.5	+35/48	2.0:1	15	55
TM6519	5	500	14.3	12	4.2	5.5	19	17	+34/40	2.0:1	15	70
TM6558	5	500	12	10.5	4.8	6.5	19	17.5	+36/48	2.0:1	15	65
TM6519	10	500	14.3	12	5.5	6	19	17	+34/40	2.0:1	15	70
TM6145	10	1000	10.7	10	3	5	19	16	+35/46	3.0:1	15	50
TM9106	5	1000	12	10.5	4.8	6	19	16	+27/32	2.0:1	15	70
TM9529	10	1600	9	7.5	6.5	8	19	18	+29/35	2.0:1	12	90
TM9138	10	2000	7.5	6	6	9.5	19	16.5	+33/46	2.2:1	15	65
TM9700	200	2000	12	10.5	2.2	4	19	18	+33/43	2.2:1	6	65
TM7221	20	200	28.5	27	2	3	18.5	15	+33/38	2.0:1	15	29
TM5149	5	150	23.5	22.5	3	3.2	18	17	+33/37	2.0:1	15	35
TM6118	10	200	10	9.4	1.5	2	18	16.5	+33/55	2.0:1	15	18
TM5150	10	300	20	19	2.5	3.5	18	17	+32/43	2.4:1	15	47
TM5175	20	500	16.3	15.5	3	3.8	18	16.5	+32/41	2.0:1	15	45
TM9196	500	1000	11.5	13.5	4	4.5	18	16	+29/48	3.0:1	15	40
CZ8130	kHz	400	14	13	6	7	18	15	+30/40	3.0:1	5.7	60
TM7281	20	250	25.5	23	2.4	3.3	17.5	15.5	+31/35	2.0:1	15	30
TM6487	10	400	15.5	14	3.2	5	17.5	15	+32/45	2.0:1	15	33
TM6570	10	500	8	7	2.5	3	17.5	17	+35/46	2.0:1	15	35
TM9327	10	2000	15	13	6.5	7.5	17.5	16	+29/38	2.0:1	15	108
TM7111	10	100	12.5	11	1.4	2	17	15.5	+33/47	2.0:1	15	14
TM7102	20	150	24.5	22.5	2	3	17	16	+29/40	2.0:1	15	31
TM7380	10	200	27.5	26	2.2	3	17	15	+31/35	2.0:1	15	28
TM6587	10	400	13	12	4	5	17	16	+32/47	2.0:1	15	32
TM5126	5	500	15	14	3	3.5	17	16	+32/42	2.0:1	15	50
TM6533	5	500	16.5	15	3.5	5.5	17	15	+32/42	2.0:1	15	50
TM6577	5	500	16.5	15	3.5	5.5	17	15	+32/42	2.0:1	15	50
TM6345	10	1100	12.3	10.5	3	4	17	15	+33/46	3.0:1	15	45
TZ9404	5	400	11	9.5	6.5	7.5	17	15	+30/38	2.0:1	15	65
CZ8463	kHz	400	10.5	9	6.5	7.5	17	15	+30/36	2.0:1	24	65
CZ8464	kHz	400	10.5	9	6.5	7.5	17	15	+30/39	2.0:1	15	65
CZ8403	5	400	10.5	9	6.8	7.5	17	15	+30/36	2.0:1	24	65
CZ8404	5	400	10.5	9	6.5	7.5	17	15	+30/36	2.0:1	15	65
TM7101	10	150	27.5	26	1.8	2.5	16.5	15	+30/35	2.0:1	15	20

Lower Power Amplifiers

This list contains those Lower Power Amplifiers (less than +20 dBm) for use where parameters other than High Power are important. Models come in standard T0-8 cans ("TM or TZ"), TO-8B ("TR"), Surface Mount ("TN OR RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.			
TM7481	10	300	28	27	2.3	3	16.5	15	+29/33	2.0:1	15	27
TM7297	20	300	10.5	9.5	4.5	6	16.5	15	+29/33	2.0:1	5	43
TM6513	5	500	17	15.5	3.7	5	16.5	15	+29/41	2.0:1	24	50
TM6515	5	500	12.5	11	4.5	5.5	16.5	15	+31/43	2.0:1	15	50
TM9718	500	1000	15	13.5	4.5	5.5	16.5	14.5	+28/35	2.0:1	15	47
TZ9202	5	200	28.5	26	5.2	6	16.5	15	+28/44	2.0:1	15	90
TM7347	5	300	13.5	12.5	2	3	16	15	+32/44	1.7:1	15	45
TM7207	10	300	18	17	2	3	16	15	+31/42	2.0:1	15	33
TM6441	20	400	14.5	13	3.5	5	16	15	+31/48	2.0:1	15	32
TR6592	100	500	25.5	24	2.2	2.5	16	14	+27/41	2.0:1	15	45
TM5119	5	500	15.5	14	2.3	3	16	14	+32/44	2.0:1	15	30
TM6581	20	500	22	21	3.5	4.5	16	13.5	+28/40	2.0:1	15	27
TM6149	5	500	15.3	14.5	5	6	16	14.5	+30/41	2.0:1	15	45
TM6576	5	500	28	26	5	6	16	14	+30/42	2.0:1	15	64
TM6523	5	500	25.5	23	5.5	7	16	14	+26/35	2.0:1	15	75
TM9318	10	1000	14.7	13.5	3.7	5.5	16	14.5	+30/42	2.0:1	15	47
TM9518	10	1000	14.7	13.5	4	5.5	16	14.5	+29/41	2.0:1	15	44
TM9333	5	1000	11.5	10	5	6.5	16	14	+30/42	2.0:1	15	48
TR9765	1700	2000	23	20	2	3	16	14.5	+27/41	2.0:1	15	80
TM9712	500	2000	11	9	3	4	16	14	+24/30	2.0:1	15	46
TM9711	1000	2000	12	10	2.2	3	16	15	+29/35	2.0:1	6	62
CZ8230*	kHz	600	10	9	7	8	16	13	+25/32	3.0:1	4.5	60
TM5670	20	250	8.2	7	2	3	15.5	13.5	+28/33	2.0:1	5	25
TM6557	10	500	15	13.5	4.5	6.5	15.5	14	+30/38	2.0:1	15	44
TM6603	5	500	10	8.5	5.5	7	15.5	14	+14/16	2.0:1	24	50
TM9167	10	800	12.5	11.5	4.5	5.5	15.5	14.5	+30/45	2.0:1	15	32
TM9117	10	1000	12	10	4	6	15.5	14.5	+28/40	2.0:1	15	46
TM9137	10	2000	9.5	7	6.5	10	15.5	13	+28/38	2.2:1	15	45
TZ9208	5	200	27.5	26	5	6	15.5	14.5	+28/44	2.0:1	12	90
TZ9216	5	200	12.5	11	5.5	7	15.5	13.5	+30/41	2.0:1	15	50
TM5104	10	500	12	10.5	2	3.5	15	13	+32/46	2.0:1	15	35
TM6544	10	500	12	10.5	2	3	15	13	+32/46	2.0:1	15	35
TM6524	5	500	31	29	3.5	4	15	14	+25/30	2.0:1	15	70
TM6667	5	600	14	12.5	4	5.5	15	14	+30/45	2.0:1	15	33
TM9366	10	1000	27.5	25.5	4	5	15	13.5	+25/32	2.0:1	15	63
TM9166	10	1200	23.5	22	4.5	5.5	15	13.5	+28/46	2.0:1	15	64

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Lower Power Amplifiers

This list contains those Lower Power Amplifiers (less than +20 dBm) for use where parameters other than High Power are important. Models come in standard T0-8 cans ("TM or TZ"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.			
TM9323	10	2000	8.5	7.5	5.5	7.5	15	14	+30/50	2.0:1	15	50
TM9302	1700	2300	10.5	8.5	5	6.5	15	14	+23/40	2.0:1	15	18
TM7381	20	250	24.5	23	2.2	3	14.5	12.5	+27/32	2.0:1	15	18
TM5519	5	500	15	14	2.3	3	14.5	11.5	+29/39	2.2:1	5	30
TM5544	10	500	12.5	11	2.5	3.5	14.5	11.5	+27/33	2.0:1	5	35
TM6607	5	500	15	14	5	6	14.5	12.5	+24/34	2.0:1	24	50
TZ9205	5	200	20.5	20	6	7	14.5	13	+35/42	2.0:1	15	90
TZ9409	5	400	12.5	11	5.5	6.5	14.5	12.5	+26/38	2.0:1	15	50
TM7210	10	200	9	8	1.3	2	14	12.5	+31/48	2.0:1	15	15
TM7205	10	200	20	19	1.6	2.2	14	12	+21/26	2.0:1	5	18
TM7272	10	200	14.7	14	3	5	14	12	+29/41	1.3:1	5	35
TM6176	5	1000	13.5	12	4	5	14	12	+27/40	2.0:1	15	38
TM9157	1	1000	10.2	8.5	4.5	6	14	13	+27/37	2.0:1	15	44
TM9522	5	1500	20.5	18.5	5	6	14	10	+25/42	2.0:1	15	64
TM9701	200	2000	12	11	3	4	14	13	+25/32	2.0:1	5	48
CZ8330*	kHz	1000	6.2	5	9.5	11	14	10	+25/31	3.0:1	4.5	60
TM6416	5	500	15	14	3.5	4.5	13.5	12	+27/35	2.0:1	15	35
TM9121	10	1500	15	13.5	4	5	13.5	12	+26/34	2.0:1	15	34
TR7215	5	200	31.5	30	2.5	4	13	10	+26/39	1.5:1	15	58
TM7270	10	250	8.3	7	1.4	2.5	13	11	+30/50	1.8:1	15	15
TM6520	5	500	14.5	13.5	3.5	4.5	13	11.5	+27/34	2.0:1	5	33
TM5109	10	500	10.5	9.5	4	5	13	12	+28/40	2.0:1	15	35
TM6672	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	9	30
TM6572	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	5	30
TM9107	5	1000	13.5	11.5	3.9	5	13	10	+22/26	2.0:1	5	33
TM9524	10	1500	22	20	4.3	5	13	10	+23/31	2.2:1	15	56
CZ8208	5	200	14.5	13	5	6	12.5	11	+26/34	2.0:1	12	36
TM7104	5	150	24	22.5	1.9	2.5	12	10.5	+25/31	2.0:1	5	20
TM9313	5	1000	16	15	3.5	4.5	12	10	+23/35	2.0:1	15	29
TM9328	10	1500	14	12.5	3.2	4.5	12	9	+23/31	2.0:1	5	27
TM9355	5	2000	10	9	4	6.5	12	10	+24/32	2.0:1	5	30
TM9136	10	2000	17	15	5.5	7.5	12	11	+22/28	2.0:1	15	63
TM9710	1000	2000	12.8	11	3.4	4	12	10.5	+23/33	2.0:1	15	26
CZ8553	5	500	19.5	18	3.5	4.5	12	9	+24/30	2.2:1	15	33
TM6555	5	500	14.7	13.5	4	6.5	11.5	9	+24/35	2.0:1	15	33
CZ8202	5	200	29	27	5.5	6.5	11.5	9.5	+23/34	2.0:1	15	55
TM6444	10	400	13	12	4	5.5	11	9	+25/37	2.0:1	5	15

Lower Power Amplifiers

This list contains those Lower Power Amplifiers (less than +20 dBm) for use where parameters other than High Power are important. Models come in standard T0-8 cans ("TM or TZ"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.			
TM6654	5	500	29	27.5	2.5	3	11	10	+23/33	2.0:1	5	40
TM6543	10	500	11	10	2.5	3	11	9	+24/35	2.0:1	15	25
TM9165	10	1000	10.5	9	4.5	6	11	9	+24/37	2.0:1	15	30
TM5147	20	1100	14	13	3.5	4	11	9	+23/33	2.0:1	15	27
TM9436	10	2000	17	15	5.5	7.5	11	10	+21/27	1.5:1	12	63
TM5304	5	200	19.5	18.5	2.5	3	10.5	9.5	+25/33	2.0:1	15	24
TM5110	10	500	15	14	2.5	3	10.5	9	+25/33	2.0:1	15	25
TZ9408	5	400	28	26	5	6	10.5	9	+22/34	2.0:1	15	45
TM6117	5	250	8.2	7	1.3	2	10	9	+28/43	2.0:1	15	12
TM7170	10	250	8.5	7.5	1.5	2.5	10	9	+26/38	2.0:1	15	12
TM7287	10	300	15.5	14.5	2.8	4	10	9	+24/33	2.0:1	5	15
TM6457	5	400	15	14	2	3	10	7.5	+24/35	2.0:1	5	16
TM6517	5	500	22.5	21	2.4	3	10	8	+22/36	2.0:1	15	22
TM6512	5	500	21	19	2.5	3.5	10	8	+21/27	2.0:1	15	23
TM6505	5	500	15	14	4	5	10	8.5	+23/33	2.0:1	15	24
TM6605	10	600	15.5	14	3	4.5	10	8	+23/32	2.0:1	15	24
TM9143	10	1000	10.5	9	2.5	4.5	10	8	+27/38	2.0:1	15	25
TM9102	5	1000	15	13.5	3	4.5	10	7.5	+23/32	2.0:1	15	23
TM9355	5	2000	10	8.5	5	6.5	10	9	+23/32	2.0:1	5	26
CZ8050*	5	1000	22.5	20.5	6	7	10	6	+23/36	2.0:1	15	67
TM7103	10	150	26.5	25	2.3	2.8	9.5	8	+23/28	2.0:1	5	16
TM7275	5	250	20.5	19	2.5	3.5	9.5	8	+22/27	2.0:1	15	24
TM7274	5	300	31	29	3	4	9.5	8	+21/32	2.0:1	15	40
TM6575	5	500	21	19	2.7	3.5	9.5	8.5	+21/28	2.0:1	15	23
TM6681	20	500	17.5	15.5	3	4	9.5	7	+23/28	2.0:1	15	29
TM9115	5	1000	14.5	13	4	5.5	9.5	8	+23/32	2.0:1	15	24
CZ8040*	kHz	300	19	18	3.8	4.5	9.5	6	+21/26	3.0:1	3.5	25
CZ8203	5	200	20	19	6	7	9.5	8	+21/39	2.0:1	15	62
TM6421	5	400	30	27	3.5	6	9	7	+22/36	2.0:1	15	37
TM6440	10	400	13	12	3.6	5	9	7.5	+23/33	2.0:1	15	15
TM6719	5	500	33	31	1.7	2	9	8	+20/36	2.0:1	15	35
TM6521	5	500	30	28	3	4	9	7	+22/30	2.0:1	15	36
TM6574	5	500	30	27	3.5	6	9	7	+22/30	2.0:1	15	37
TM9193	400	1200	15	14	3	4	9	8.5	+22/36	2.0:1	15	19
TM9325	10	1500	14	13	3.5	4.5	9	7.5	+22/30	2.0:1	15	24
TM9502	5	1500	10.5	8.5	4	5.5	9	7	+24/32	2.0:1	15	23
TM9322	10	2000	10	8.5	5	6.5	9	7.5	+23/35	2.0:1	15	25

Lower Power Amplifiers

This list contains those Lower Power Amplifiers for use where parameters other than High Power (less than +20 dBm) are important. Models come in standard T0-8 cans ("TM or TZ"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC) (mA)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.	Typ.			
TM9135	10	2000	10	8.5	5	6.5	9	7.5	+23/35	2.0:1	15	25
CZ8120	KHz	400	15	13	5	6.5	9	7	+21/25	2.5:1	+5	25
CZ8402	5	400	15	13.5	4.7	5.8	9	7	+20/27	2.0:1	15	25
TM9164	10	1200	26	24	3.6	4.5	8.5	6.5	+20/33	2.0:1	15	35
TZ9402	5	400	15	13	5	6	8.5	7	+21/27	2.0:1	15	25
CZ8462	KHz	400	14.5	13	5	7	8.5	7	+20/27	2.2:1	15	25
TM7286	10	200	28	26	2.5	3.5	8	7	+20/29	2.0:1	+5	21
TM7203	5	250	32	30	3	4	8	6.5	+18/30	2.0:1	15	35
TM7487	10	300	15.5	14.5	3	4	8	7	+22/31	2.0:1	+5	13
TM6181	10	400	8.5	7.5	1.7	2.5	8	7	+23/40	2.0:1	15	11
TM6554	5	400	27.5	25	5	6	8	6	+19/32	2.0:1	15	33
TM9124	10	1500	20	18	4	5.5	8	6	+21/42	2.0:1	15	34
TM9125	10	1500	10.5	9	4.5	6	8	7	+21/33	2.0:1	15	24
CZ8220	KHz	600	10	9	6	7.5	8	6	+20/26	2.5:1	+3.2	25
CZ8052	5	1000	21.5	20	6	7	8	6	+20/39	2.0:1	15	60
CZ8320	KHz	1000	9	7	7	8	8	6	+20/27	2.5:1	+2.8	25
TZ9207	5	200	28.5	26	5	6	8	6	+20/33	2.0:1	12	38
TZ9201	5	200	29.5	27	5	6	8	6	+19/34	2.0:1	15	35
TM7288	5	250	22	21	1.8	2.2	7.5	6.5	+20/23	2.0:1	15	18
TM6143	5	500	15.7	14.5	1.6	2.5	7.5	5	+20/28	2.5:1	15	15
TM6210	5	500	15.3	14	2	3	7.5	4.5	+18/26	2.5:1	+5	12
TM5101	5	500	13	12	2.8	4	7.5	6	+21/31	2.0:1	15	17
TM5131	5	1300	18	17	5	5.5	7.5	6	+20/40	2.0:1	15	40
TZ9203	5	200	31.5	30	3.5	4	7.5	6	+19/35	2.0:1	15	35
TZ9206	5	200	24	22	4.5	5.5	7.5	6	+18/38	2.0:1	15	37
TM7201	5	250	29	27.5	5	6.5	7	5.5	+19/30	2.0:1	15	35
TM5105	5	300	12	11	2.8	4	7	5.5	+21/29	2.0:1	15	17
TM9312	5	1000	16.5	15	3	4	7	5	+20/24	2.0:1	15	18
TM9114	10	1500	20	18	4	5.5	7	5	+21/42	2.0:1	12	34
TM6153	300	1800	11.5	10.5	3	4	7	6	+18/22	3.0:1	15	18
TZ9212	0.1	200	31.5	30	3.5	4	7	5	+17/33	2.0:1	15	35
TZ9209	5	200	30.5	29	3.5	4	7	5	+18/28	2.0:1	12	36
TZ9210	0.1	200	29	27.5	4.5	6	7	5	+19/33	2.0:1	15	35
TM5118	3	100	16.3	15.5	1.5	2	6.5	5.5	+19/25	2.5:1	15	21
TM6443	10	400	13.2	12	3.5	5	6.5	5	+19/27	2.0:1	+5	10
TM9324	10	2000	16	14	4.7	6	6.5	4.5	+19/37	2.0:1	15	38
TZ9204	5	200	20.8	20	6	7	6.5	5.5	+18/35	2.0:1	15	37

Lower Power Amplifiers

This list contains those Lower Power Amplifiers (less than +20 dBm) for use where parameters other than High Power are important. Models come in standard T0-8 cans ("TM or TZ"), TO-8B ("TR"), Surface Mount ("TN or RN"), and SMA Connectorized Housings ("BX").

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm)	VSWR	Power Supply (DC)	
	Low	High	Typ.	Min.	Typ.	Max.	Typ.	(dBm) Min.			(DC)	(mA)
TM9363	5	1000	16.5	15	3	4	6	4	+19/25	2.0:1	15	16
TM9316	10	1200	13	12	3	4	6	4.5	+19/28	2.0:1	5	15
TM9134	100	2000	16.5	14	4.5	6	6	3	+16/33	2.0:1	15	35
CZ8201	5	200	32	30	3.2	4	5.8	3	+16/38	2.0:1	15	30
TM6675	5	500	20.5	19	2.3	3	5	4	+18/21	2.0:1	15	15
TM9163	5	1000	16	15	2.5	3.5	5	3	+16/21	2.0:1	15	14
CZ8653	5	250	22	20	3	3.2	5	2.5	+15/17	2.0:1	15	15
TM9123	10	1500	12	10	4	4.5	4	3	+17/22	2.0:1	15	14
CZ8207	5	200	18	17	4	5	4	0	+15/17	2.0:1	5	17
CZ8206	5	200	32	30	3.5	4	3.5	1	+15/26	2.0:1	12	30
TM7208	5	250	22.5	21	1.4	2	3	0	+16/13	2.0:1	15	10
TM6501	5	500	16.5	15.5	2.5	3.5	3	1	+15/17	2.0:1	15	10
TM6510	5	500	16.5	15.5	2.5	3.5	3	1	+15/17	2.0:1	15	10
TM9133	10	2000	9.5	8	4.5	5.5	3	2	+16/23	2.0:1	15	14
CZ8251	5	200	26.5	24	4	4.5	3	-1	+14/27	2.0:1	5	30
CZ8453	5	250	21	19.5	3	3.2	3	-1	+15/14	2.3:1	5	16
CZ8451	5	250	17	15.5	2.2	3	2.5	0	+14/15	2.0:1	5	12.5
TM7371	5	250	18	16	1.8	2.5	2	1	+14/15	2.0:1	15	9
TM6511	5	500	16.5	15.5	2.5	3	2	1	+14/16	2.0:1	15	10
TM6573	5	500	32	29	2.5	3.5	2	-2.5	+14/19	2.0:1	15	20
TM5107	10	550	15	14	1.75	2.3	2	1	+13/16	2.0:1	15	9
TM9311	5	1000	16.5	15	2.3	3	2	-1	+14/17	2.0:1	15	10
TM9331	10	2000	11.5	10.5	4	4.5	2	0	+14/21	2.0:1	15	11
TM6503	5	500	16.5	15.5	3.5	4.5	1.5	0	+14/16	2.0:1	15	10
TM9511	5	1000	16.5	15	2.3	3	1	-1	+14/16	2.0:1	15	9.5
TM9111	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM9101	5	1000	15	14	2.4	4	1	-2	+12/15	2.0:1	15	9
TM7271	5	250	18	16	1.5	2.8	0.5	-1	+13/13	2.0:1	15	9
TM6171	5	500	15.2	14	2.3	3	0.5	-2	+12/15	2.0:1	15	11
TZ9411	5	400	15	14	4.5	6	0.5	-2	+13/15	2.0:1	12	12
TM9566	10	1000	26	24.5	3	4	0.1	-0.5	+12/21	2.0:1	15	18
LN7253	5	200	32	28	3	4	0	-2	+14/23	2.0:1	5	30
CZ8111	KHz	400	15.8	14	3	4	-0.2	-2	+21/11	3.0:1	2	10
CZ8110	KHz	400	15	13	4	5.5	-0.2	-5	+10/8	2.5:1	3	10
TM6683	10	250	34	32.5	2	3	-1	-3	+10/9	2.0:1	5	14
TM5441	10	400	14.5	13	3.8	4.5	-1	-4	+25/33	2.0:1	5	33
TM6583	10	500	30	28	2.3	3	-1	-4	+10/13	2.0:1	5	13

Lower Voltage Amplifiers

This list contains Lower Voltage Amplifiers for use where a bias supply of less than +10 volts is needed. Models come in standard T0-8 cans ("TM"), TO-8B ("TR"), Surface Mount ("TN OR RN"), and SMA Connectorized Housings ("BX"). Units listed are sorted by Output Power.

Model	Frequency Range (MHz)		Gain (dB)		Noise (dB)		Output Power @ 1 dB Compression		IP3/IP2 (dBm) Typ.	VSWR Max.	Power Supply	
	Low	High	Typ.	Min.	Typ.	Max.	Typ. (dBm)	Min.			Typ. (DC)	Typ. (mA)
TM9702	500	1500	12	10.5	2.8	4	19.8	19	+31/40	2.0:1	8	107
TM3037	1030	1090	13.5	13	<2.0	2.3	19.5	19	+31/45	2.0:1	5	78
TM9700	200	2000	12	10.5	2.2	4	19	18	+33/43	2.2:1	6	65
TM9700	200	2000	12	10.5	2.2	4	19	18	+33/43	2.2:1	6	65
CZ8130*	KHz	400	14	13	6	7	18	15	+28/36	3.0:1	5.7	60
TM7297	20	300	10.5	9.5	4.5	6	16.5	15	+29/33	2.0:1	5	43
TM9711	1000	2000	12	10	2.2	3	16	15	+29/35	2.0:1	6	62
CZ8230	KHz	600	10	9	7	8	16	13	+25/32	3.0:1	4.5	60
TM9711	1000	2000	12	10	2.2	3	16	15	+29/35	2.0:1	6	62
TM5670	20	250	8.2	7	2	3	15.5	13.5	+28/33	2.0:1	5	25
TR9756	1200	1700	27	25	<1.0	1.75	15	14	+26/40	1.75:1	5	60
TR9756	1700	2400	23	22	1.5	2.2	15	14	+26/40	2.2:1	5	60
TM5519	5	500	15	14	2.3	3	14.5	11.5	+29/39	2.2:1	5	30
TM5544	10	500	12.5	11	2.5	3.5	14.5	11.5	+27/33	2.0:1	5	35
TR9755	800	1200	26	24	1.0	1.75	14	13	+25/40	2.0:1	5	62
TM7205	10	200	20	19	1.6	2.2	14	12	+21/26	2.0:1	5	18
TM7272	10	200	14.7	14	3	5	14	12	+29/41	1.3:1	5	35
TM9701	200	2000	12	11	3	4	14	13	+25/32	2.0:1	5	48
CZ8330	KHz	1000	6.2	5	9.5	11	14	10	+25/31	3.0:1	4.5	60
TM6520	5	500	14.5	13.5	3.5	4.5	13	11.5	+27/34	2.0:1	5	33
TM6572	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	5	30
TM9107	5	1000	13.5	11.5	3.9	5	13	10	+22/26	2.0:1	5	33
TM6672	5	500	14.7	13.5	4	5.5	13	11	+27/38	2.0:1	9	30
TM7104	5	150	24	22.5	1.9	2.5	12	10.5	+25/31	2.0:1	5	20
TM9328	10	1500	14	12.5	3.2	4.5	12	9	+23/31	2.0:1	5	27
TM9355	5	2000	10	9	4	6.5	12	10	+24/30	2.0:1	5	30
TM6654	5	500	29	27.5	2.5	3	11	10	+23/33	2.0:1	5	40
TM6444	10	400	13	12	4	5.5	11	9	+25/37	2.0:1	5	15
TM7287	10	300	15.5	14.5	2.8	4	10	9	+24/33	2.0:1	5	15
TM6457	5	400	15	14	2	3	10	7.5	+24/35	2.0:1	5	16
TM9355	5	2000	10	8.5	5	6.5	10	9	+23/32	2.0:1	5	26
TM7103	10	150	26.5	25	2.3	2.8	9.5	8	+23/28	2.0:1	5	16
CZ8040	KHz	300	19	18	3.8	4.5	9.5	6	+21/26	3.0:1	3.5	25
CZ8120	KHz	400	15	13	5	6.5	9	7	+21/25	2.5:1	5	25
TM3001	400	1200	15	14	3	4	>8.5	8.5	+21/30	2.0:1	5	19
TM3031	100	500	13	12	<2.2	2.5	8.5	7	+2-/29	2.0:1	3.3	20
TM7286	10	200	28	26	2.5	3.5	8	7	+15/21	2.0:1	5	21
TM7487	10	300	15.5	14.5	3	4	8	7	+22/31	2.0:1	5	13
CZ8320	KHz	1000	9	7	7	8	8	6	+20/27	2.5:1	2.8	25
CZ8220	KHz	600	10	9	6	7.5	8	6	+20/26	2.5:1	3.2	25
TM6210	5	500	15.3	14	2	3	7.5	4.5	+18/26	2.5:1	5	12
TM6443	10	400	13.2	12	3.5	5	6.5	5	+19/27	2.0:1	5	10

RF AMPLIFIER

MODEL *FPMP1000*

Available as: Flatpack

Features

- Wideband Frequency: 100-1000 MHz
- High Output Power: +30 dBm Typical
- Operating Temp. 0 °C to + 70 °C

Specifications

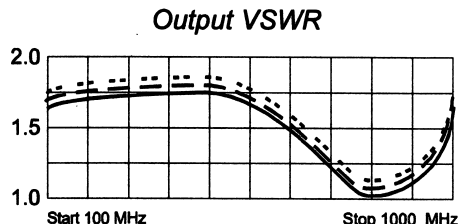
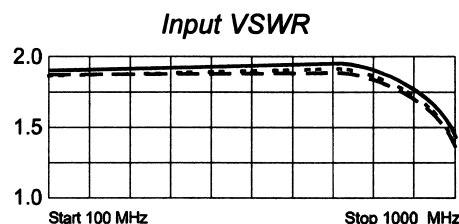
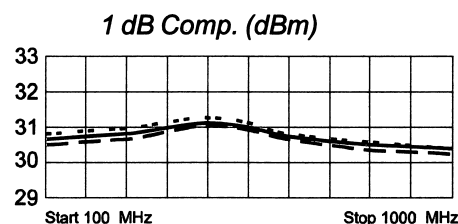
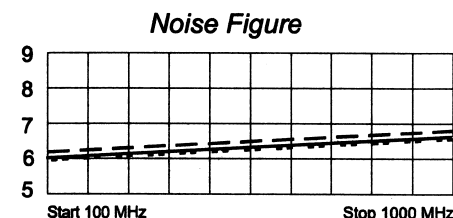
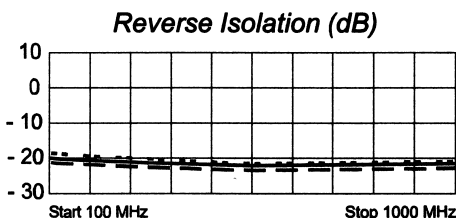
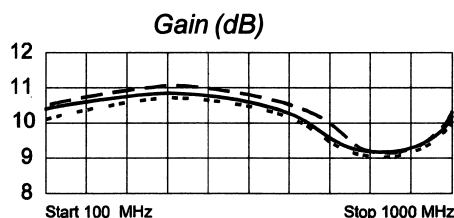
CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = 0 °C to +70 °C
Frequency (MHz)	100 - 1000 MHz	100 - 1000 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	30	29 Min.
Reverse Isolation (dB)	-20	-15 Max.
VSWR In	1.8:1	2:0:1 Max.
Out	1.8:1	2:0:1 Max.
Noise figure (dB)	7	11 Max.
Power Vdc	+15	+15
mA	350	375 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts

Typical Performance Data



Legend ——— + 25 °C ——— + 70°C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001

RF AMPLIFIER

MODEL *BXMP1001*

Package:
Connectorized Housing

Features

- Low Noise Figure: 3.7 dB Typical
- High 3rd Order Intercept: >+49 dBm Typical
- High Power 1 db Comp. +32 dBm

Specifications

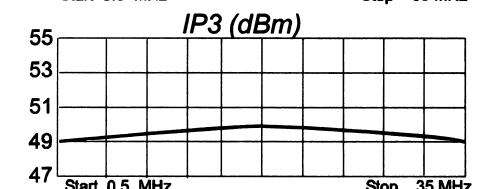
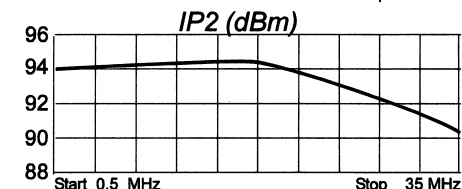
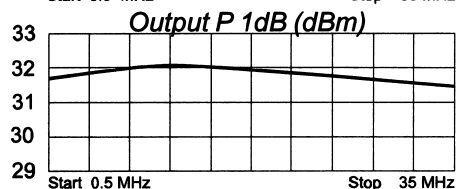
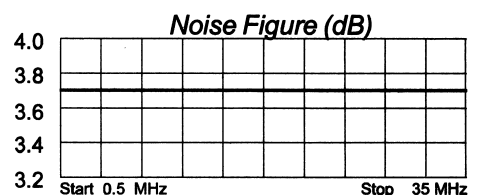
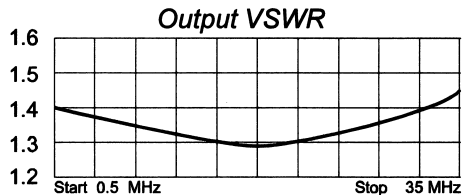
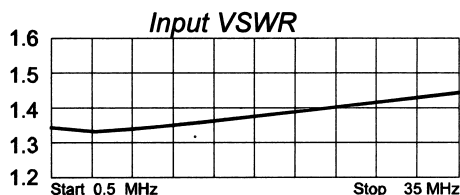
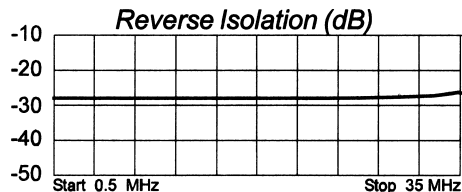
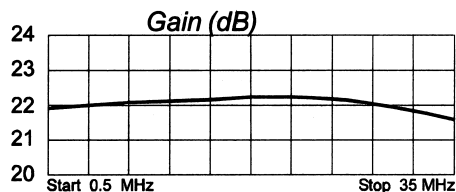
CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = 0 °C to +50 °C
Frequency	0.5 - 35 MHz	0.5 - 35 MHz
Gain (dB)	22	22.5 Max.
Gain Flatness (dB)	0.5	21.5 Min.
Power @ 1 dB Comp. (dBm)	+32	+31 Min.
IP2 0.5-25 MHz	95	92 Min.
25-35 MHz	92	90 Min.
IP3	49	47 Min.
Reverse Isolation (dB)	- 27	- 26 Min.
VSWR In	<1.5:1	1.5:1 Max.
Out	<1.5:1	1.5:1 Max.
Noise figure (dB)	3.7	4.0 Max.
Power Vdc	+24	+24
mA	425	450 Max.

Maximum Ratings

Ambient Operating Temperature 0°C to + 50 °C
Storage Temperature -55°C to + 85 °C
DC Voltage + 25 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
1 Minute Max.)

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data @25°C



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RF AMPLIFIER

MODEL FPMP1002

Package: Flatpack
Available as: Surface Mount - Gullwing
 Connectorized Housing

Features

- High Power Output: + 30.5 dBm
- Medium Gain: 10 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 100 MHz	10 - 100 MHz
Gain (dB)	10	8.5
Power @ 1 dB Comp. (dBm)	+ 30.5	+ 30 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	5.5	6.0 Max.
Power Vdc	+15	+15
mA	320	365 Max.

Note: Care should always be taken to effectively ground the case of each unit.

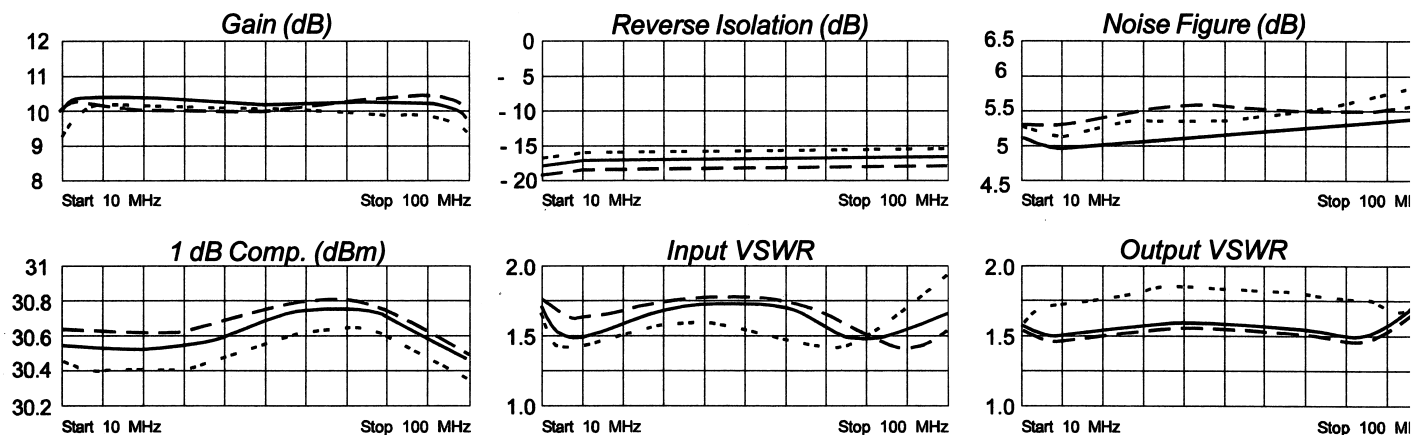
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +60 (Typ)
 Second Order Two Tone Intercept Point +54 (Typ)
 Third Order Two Tone Intercept Point +45 (Typ)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 27 dBm
 Short Term RF Input Power 500 Milliwatts
 (1 Minute Maximum)
 Maximum Peak Power 0.5 Watt
 (3 µsec Maximum)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

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RF AMPLIFIER

MODEL BXMP1003

Package:
Connectorized Housing

Features

- Low Noise Figure: 3.7 dB Typical
- High 3rd Order Intercept: >+49 dBm Typical
- High Power 1 db Comp. +32 dBm

Specifications

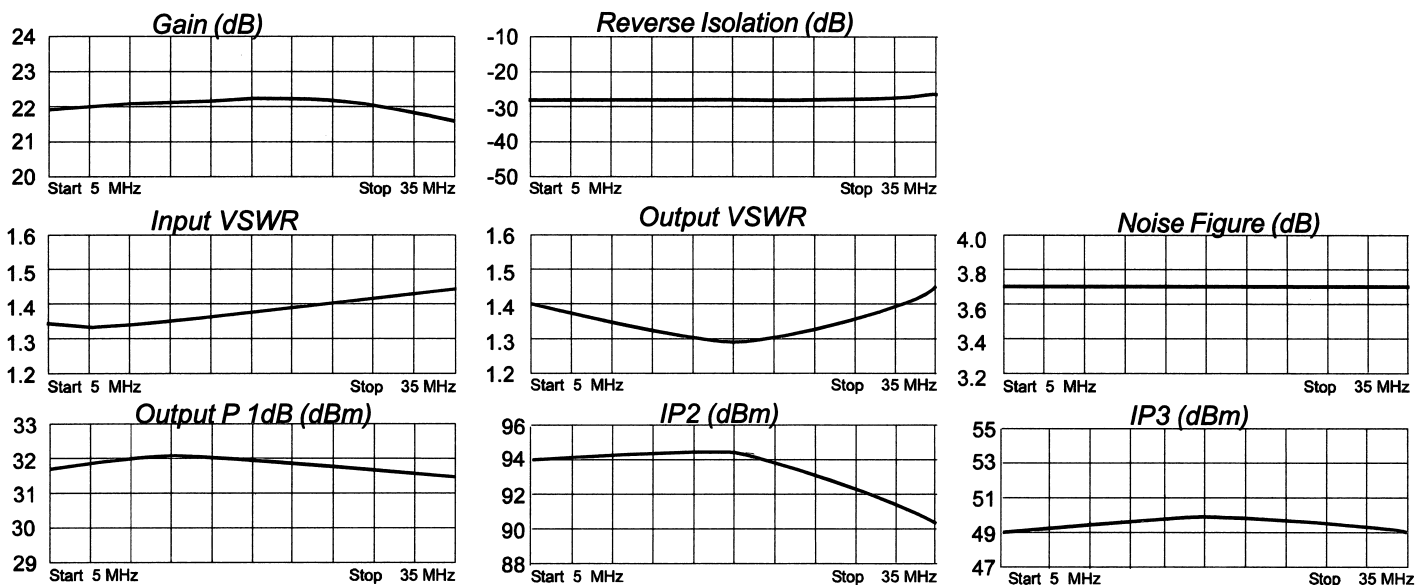
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = 0 °C to +50 °C
Frequency	5 - 35 MHz	5 - 35 MHz
Gain (dB)	22	22.5 Max.
Gain Flatness (dB)	0.5	21.5 Min.
Power @ 1 dB Comp. (dBm)	+32	+31 Min.
IP2 5-25 MHz	95	92 Min.
25-35 MHz	92	90 Min.
IP3	49	47 Min.
Reverse Isolation (dB)	- 27	- 26 Min.
VSWR In	<1.5:1	1.5:1 Max.
Out	<1.5:1	1.5:1 Max.
Noise figure (dB)	3.7	4.0 Max.
Power Vdc	+24	+24
mA	425	450 Max.

Maximum Ratings

Ambient Operating Temperature 0°C to + 50 °C
Storage Temperature -55°C to + 85 °C
DC Voltage + 25 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
1 Minute Max.)

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data @25°C



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RF AMPLIFIER

MODEL *TM3001*

Available as: TM3001, 4 Pin TO-8 (T4)
 TN3001, 4 Pin Surface Mount (SM3)
 FP3001, 4 Pin Flatpack (FP4)
 BX3001, Connectrized Housing (H1)

Features

- 5 Volt Operation; Medium Gain: 15 ± 1.0 dB
- Medium Output Power: $+10 \pm 1.5$ dBm
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +35 (Min.)
 Second Order Two Tone Intercept Point +30 (Min.)
 Third Order Two Tone Intercept Point +21 (Min.)

Specifications

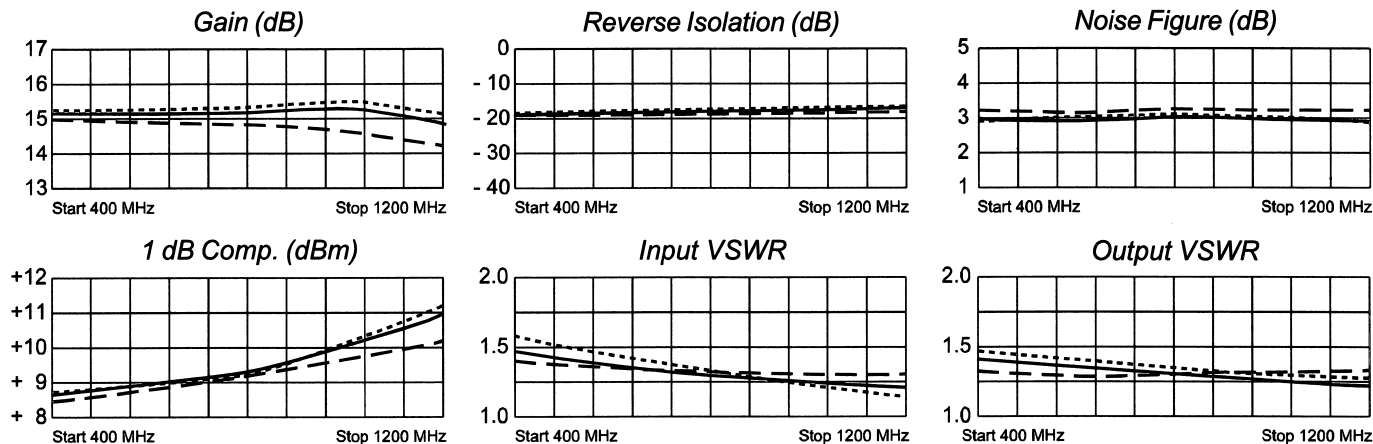
CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	400 - 1200 MHz	400 - 1200 MHz
Gain (dB)	15	15 ± 1.0
Power @ 1 dB Comp. (dBm)	>+8.5	$+10.0 \pm 1.5$
Reverse Isolation (dB)	- 16.5	-16.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3	4.0 Max.
Power Vdc	+5	+5
mA	19	25.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.1 Watt
 (3 µsec Max.)

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

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Rev. A 1/22/01
 TME661

RF AMPLIFIER

MODEL *TR3020*

Package Style: 4 Pin TO-8B
Also Available in: 4 Pin Flatpack, Surface Mount Flatpack, and Connectorized Housings

Features

- High Out put Power: +23 dBm Minimum
- High Gain: 19 dB Minimum
- Operating Case Temp. - 26 °C to +71 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Tc = 25 °C	MIN/MAX Tc = -26 °C to
Frequency	500 - 1000 MHz	500 - 1000 MHz
Gain (dB)	20.5	20.75 ± 1.75
Power @ 1 dB Comp. (dBm)	+25	+23.0 Min.
Reverse Isolation (dB)	- 41	-40.0 Max.
VSWR In	<1.8:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
VSWR Vdc	+12	+12 Max.
mA	255	270 Max.

Note: Care should always be taken to effectively ground the case of each unit.

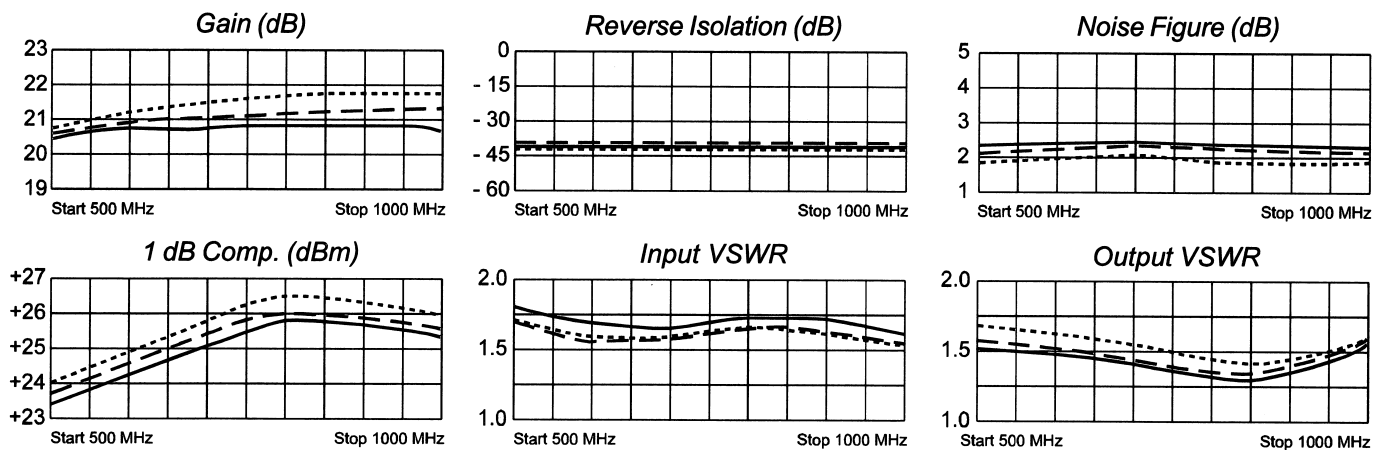
Intermodulation Performance

- Second Order Harmonic Intercept Point +45 (Min.)
Second Order Two Tone Intercept Point +42 (Min.)
Third Order Two Tone Intercept Point +32 (Min.)

Maximum Ratings

- Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 15 Volts
Continuous RF Input Power + 13dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 71 °C -26 °C



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03/08/00
TRE338

RF AMPLIFIER

MODEL *TM3028*

Available as: TM3028, 4 Pin TO-8 (T4)
 TN3028, 4 Pin Surface Mount (SM3)
 FP3028, 4 Pin Flatpack (FP4)
 BX3028, Connectrized Housing (H1)

Features

- High Power: +24 dBm Typ.
- Low Noise: 2.2 dB Typ.
- Operating Temp. - 55 °C to +85 °C
- Units are Unconditionally Stable

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	40-100 MHz	40-100 MHz
Gain (dB)	20.5	19.5 Min./21.0 Max.
Power @ 1 dB Comp. (dBm)	+24	+23.0 Min.
Reverse Isolation (dB)	- 25	-24 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.45:1	2.0:1 Max.
Noise figure (dB)	2.2	3.0 Max.
Power Vdc	+15	+15
mA	82	94 Max.

Note: Care should always be taken to effectively ground the case of each unit.

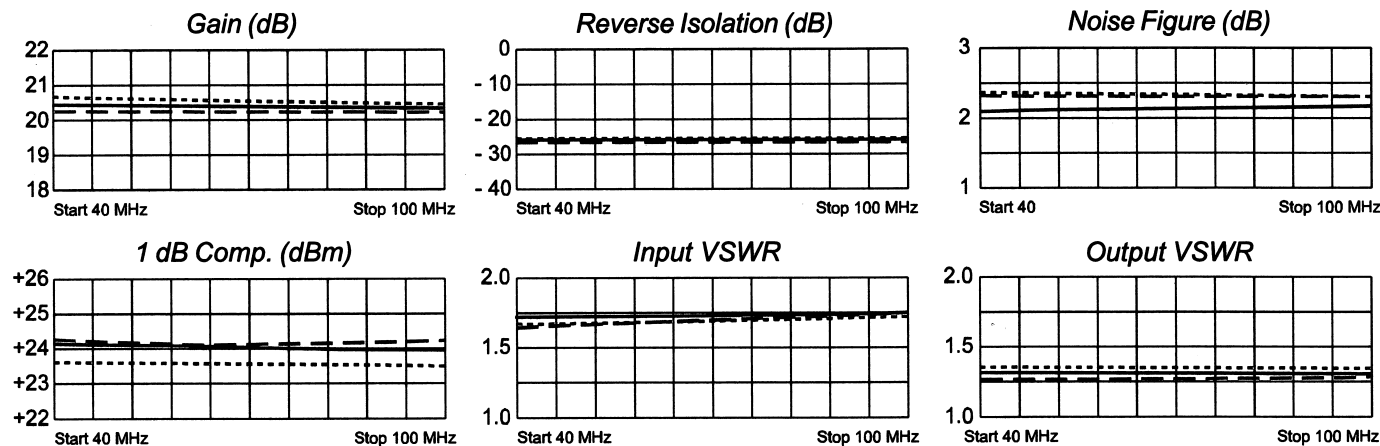
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +57 (Min.)
 Second Order Two Tone Intercept Point +51 (Min.)
 Third Order Two Tone Intercept Point +38 (Min.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

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TME515

RF AMPLIFIER

MODEL TR3029

Available as: TR3029, 4 Pin TO-8 (T4)
RN3029, 10 Lead Gull-Wing (SG4)
BR3029, Connectorized Housing (H2)

Features

- Low Noise Figure: 2.5dB Max., Freq. < 400 MHz
- High Third Order Intercept: +27 dBm Minimum
- Operating Temp. - 55 °C to +85 °C
- Units are Unconditionally Stable

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100 - 500 MHz	100 - 500 MHz
Gain (dB)	25.5	24
Power @ 1 dB Comp. (dBm)	+16	+14.0 Min.
Reverse Isolation (dB)	- 32	-30 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<2.2	2.5 * Max.
Power Vdc	+15	+15
mA	45	52 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

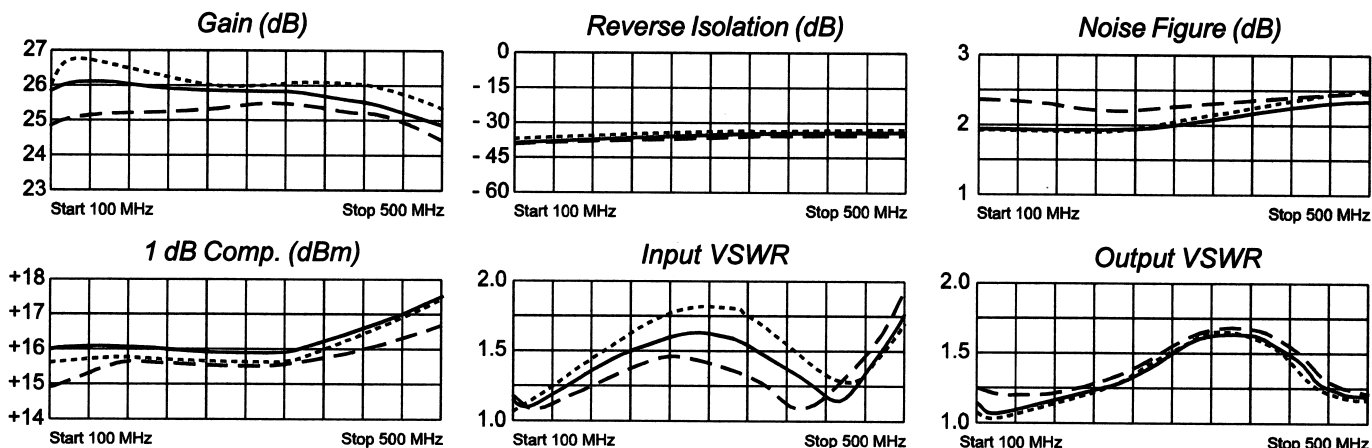
Second Order Harmonic Intercept Point +46 (Min.)
Second Order Two Tone Intercept Point +41 (Min.)
Third Order Two Tone Intercept Point +27 (Min.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power +13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.2 Watt
..... (3 µsec Max.)

* Above 400 MHz, Noise Figure = 3.0 dB Maximum

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Amplifonix

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06/29/01
TRE516-1

RF AMPLIFIER

MODEL *TM3030*

Available as: TM3030, 4 Pin TO-8 (T4)
 TN3030, 4 Pin Surface Mount (SM3)
 FP3030, 4 Pin Flatpack (FP4)
 BX3030, Connectrized Housing (H1)

Features

- Medium Output Power: +14.5 dBm Minimum
- Medium Third Order Intercept: +28 dBm Minimum
- Operating Temp. - 55 °C to +85 °C
- Units are Unconditionally Stable

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	500 - 1000 MHz	500 - 1000 MHz
Gain (dB)	15	13.5
Power @ 1 dB Comp. (dBm)	+16.5	+14.5 Min.
Reverse Isolation (dB)	- 17	-15.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	5.5 Max.
Power Vdc	+15	+15
mA	47	52.0 Max.

Note: Care should always be taken to effectively ground the case of each unit.

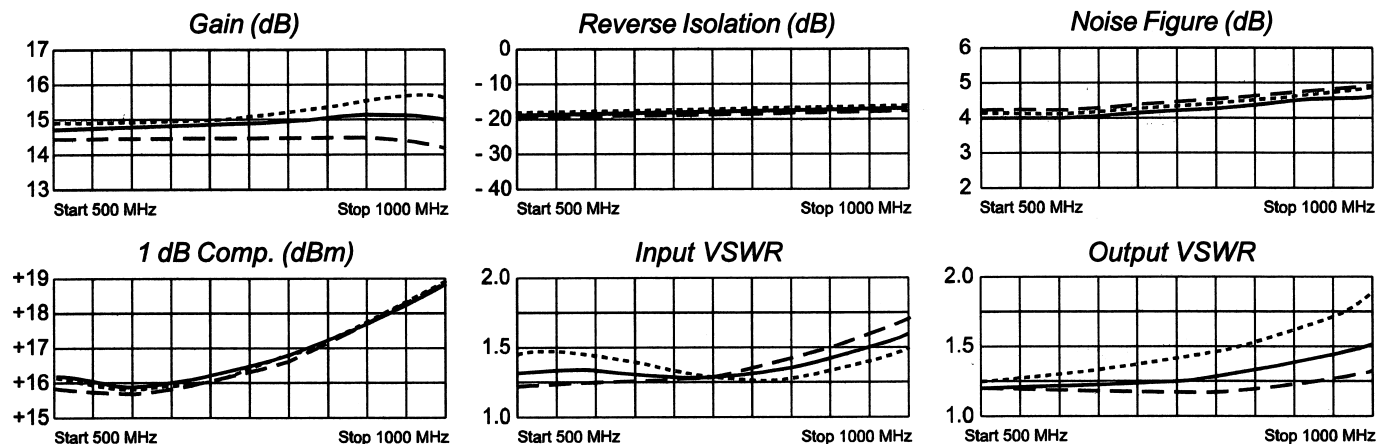
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Min.)
 Second Order Two Tone Intercept Point +35 (Min.)
 Third Order Two Tone Intercept Point +28 (Min.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



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TME540

RF AMPLIFIER

MODEL *TM3031*

Package Style: 4 Pin TO-8

Also Available in: 4 Pin Flatpack, Surface Mount Flatpack, and Connectorized Housings

Features

- 3.3 Volt Operation
- Low Noise Figure: 2.5 dB Maximum
- Operating Temp. - 10 °C to +60 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -10 °C to +60 °C
Frequency	100 - 500 MHz	100 - 500 MHz
Gain (dB)	13	13.5 ± 1.5
Power @ 1 dB Comp. (dBm)	+8.5	+7.0 Min.
Reverse Isolation (dB)	- 19	-18.0 Max.
VSWR In	<1.85:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<2.2	2.5 Max.
VSWR Vdc	+3.3	+3.3 Max.
mA	19.2	20

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

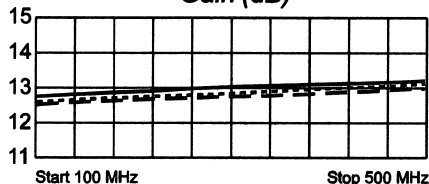
Second Order Harmonic Intercept Point +35 (Typ.)
 Second Order Two Tone Intercept Point +29 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

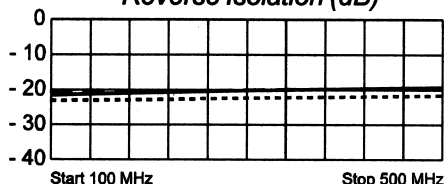
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 20 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.05 Watt
 (3 µsec Max.)

Typical Performance Data

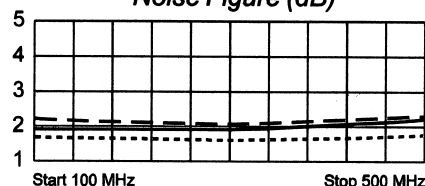
Gain (dB)



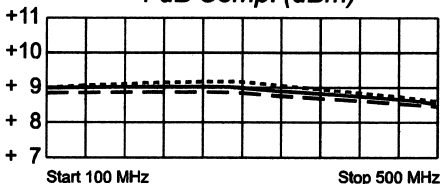
Reverse Isolation (dB)



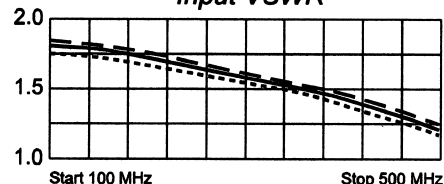
Noise Figure (dB)



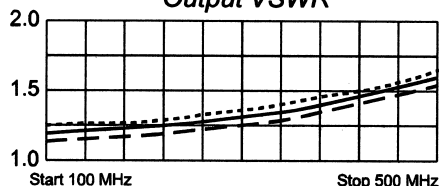
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 60 °C - - - - - - - - -10 °C

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RF AMPLIFIER

MODEL *TM3032*

Package Style: 0.45" Sq. Surface Mount
Also Available in: 4 Pin Flatpack, TO-8
 Package, and Connectorized Housings

Features

- Low Noise Figure: 2 dB Typical
- Medium Gain: 16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100 - 400 MHz	100 - 400 MHz
Gain (dB)	16.5	16.0 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+8.0 Min.
Reverse Isolation (dB)	- 19	-17.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
VSWR Vdc	+15	+15 Max.
mA	16	18 Max.

Note: Care should always be taken to effectively ground the case of each unit.

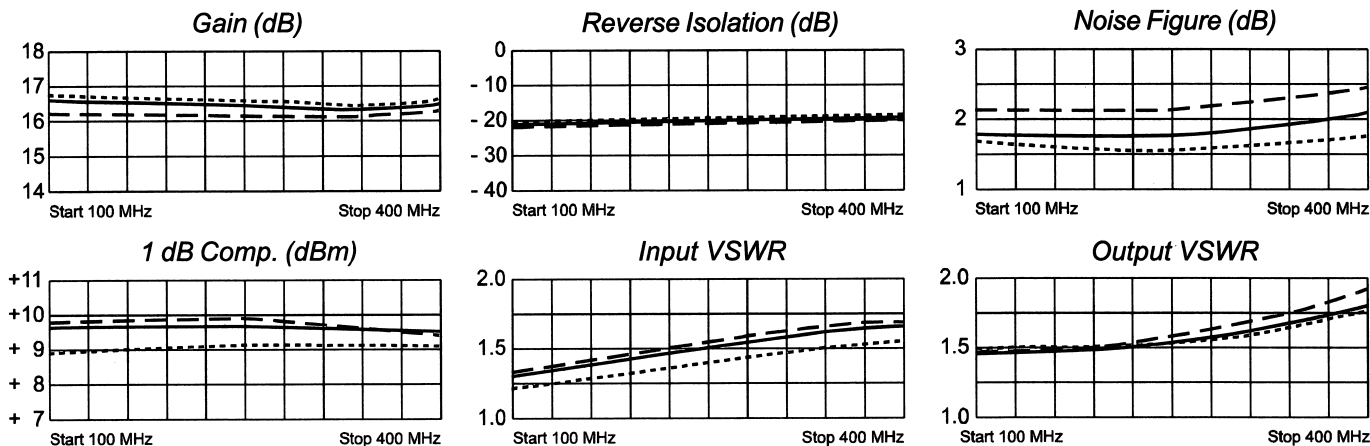
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +34 (Typ.)
 Second Order Two Tone Intercept Point +29 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.1 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

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10/16/00
TNE649

RF AMPLIFIER

MODEL *TM3033*

Package Style: 4 Pin TO-8

Also Available in: 4 Pin Flatpack, Surface Mount Flatpack, and Connectorized Housings

Features

- High Output Power: +22 dBm Typical
- High IP3: +36 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	30 - 1000 MHz	30 - 1000 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.5 Min.
Reverse Isolation (dB)	- 18	-17.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	6.0 Max.
VSWR Vdc	+15	+15 Max.
mA	90	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

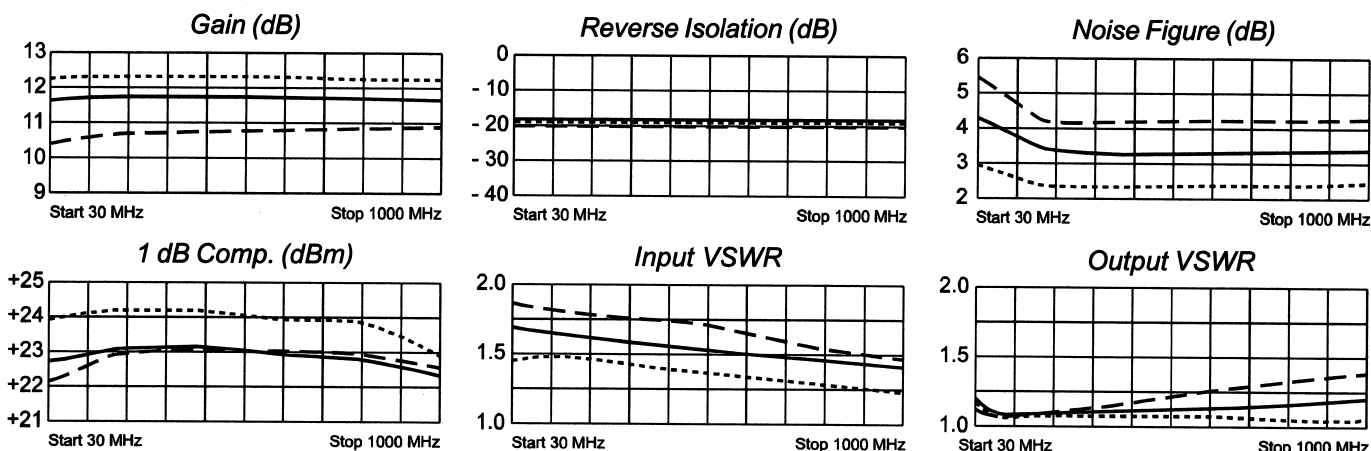
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +50 (Typ.)
Second Order Two Tone Intercept Point +45 (Typ.)
Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

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10/20/00
TME656

RF AMPLIFIER

MODEL *TM3035*

Available as: TM3035, 4 Pin TO-8 (T4)
 TN3035, 4 Pin Surface Mount (SM3)
 FP3035, 4 Pin Flatpack (FP4)
 BX3035, Connectorized Housing (H1)

Features

- High Output Power: >+28.5 dBm
- Medium Gain: 16 dB Typical
- Operating Temp. - 55 °C to +100 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +45 (Typ.)

Maximum Ratings

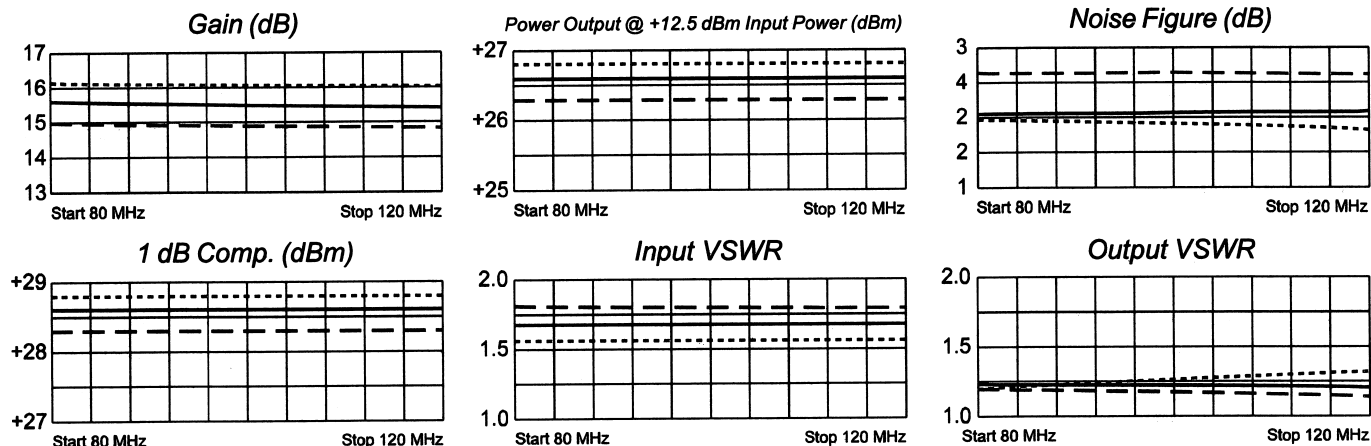
Ambient Operating Temperature -55°C to + 110 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +100 °C
Frequency	80 - 120 MHz	80 - 120 MHz
Gain (dB)	16	15
Power @ 1 dB Comp. (dBm)	+28.5	+27 Min.
Reverse Isolation (dB)	- 22.5	-21.5 Max.
VSWR In	<1.9	2.0:1 Max.
Out	<1.25	2.0:1 Max.
Noise figure (dB)	<3	5.0 Max.
Power Vdc	+11	+11
mA	200	215 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - - + 100 °C -55 °C

Amplifonix

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TNE662

RF AMPLIFIER

MODEL *TM3036*

Available as: TM3036, 4 Pin TO-8 (T4)
TN3036, 4 Pin Surface Mount (SM3)
FP3036, 4 Pin Flatpack (FP4)
BX3036, Connectorized Housing (H1)

Features

- High Out put Power: +25.5 dBm Typical
- High Third Order Intercept: +40 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	30 - 110 MHz	30 - 110 MHz
Gain (dB)	20.5	20.5 ± 0.75
Power @ 1 dB Comp. (dBm)	+25.5	+24.0 Min.
Reverse Isolation (dB)	- 25	-24.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
VSWR Vdc	+15	+15 ± 0.3
mA	102	115 Max.

Note: Care should always be taken to effectively ground the case of each unit.

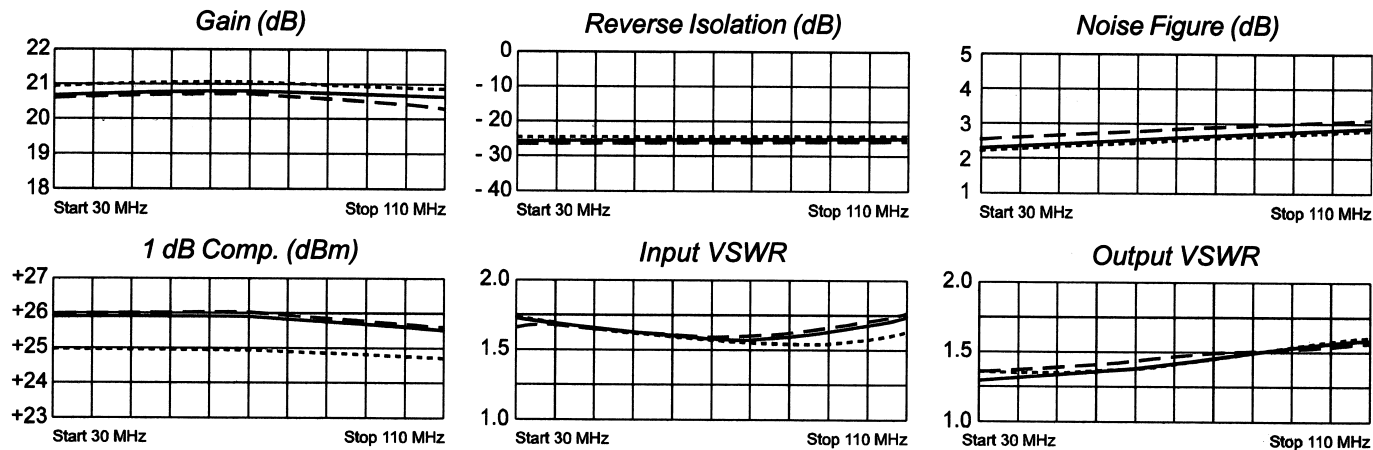
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
Second Order Two Tone Intercept Point +50 (Typ.)
Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.2 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

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2/17/00
TME685

RF AMPLIFIER

MODEL *TM3037*

Available as: TM3037, 4 Pin TO-8 (T4)
 TN3037, 4 Pin Surface Mount (SM3)
 FP3037, 4 Pin Flatpack (FP4)
 BX3037, Connectorized Housing (H1)
 PN3037, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 2.3 dB Maximum
- High Output Power: +19 dB Minimum
- Operating Temp. 0 °C to +50 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = 0 °C to +50 °C
Frequency	1030 -1090 MHz	1030 -1090 MHz
Gain (dB)	13.5	13.5 ± 0.5
Power @ 1 dB Comp. (dBm)	+19.5	+19.0 Min.
Reverse Isolation (dB)	- 21.5	-21 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.95:1	2.0:1 Max.
Noise figure (dB)	<2.0	2.3 Max.
Power Vdc	+5	+5
mA	78	80 Max.

Note: Care should always be taken to effectively ground the case of each unit.

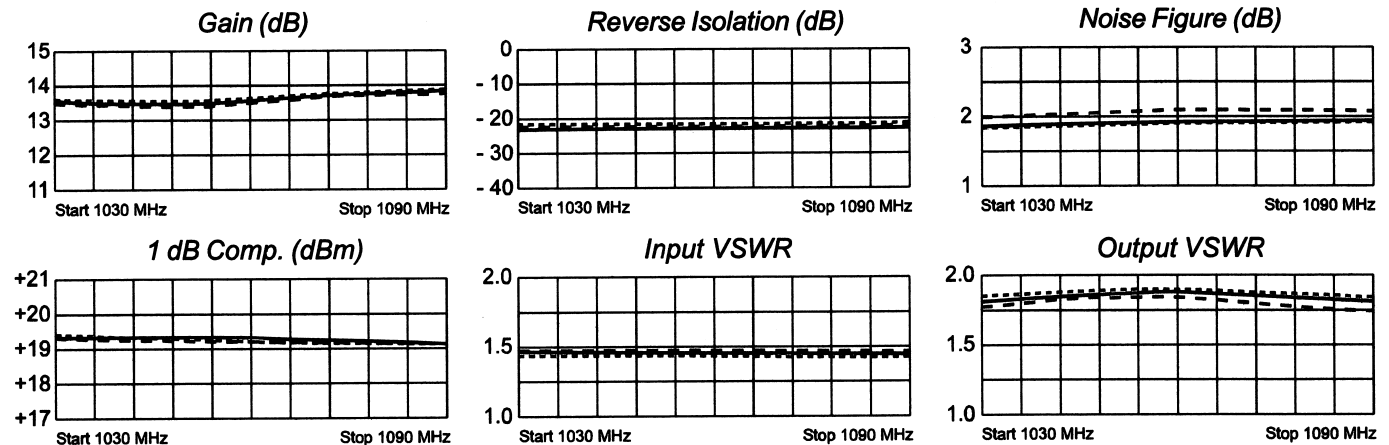
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 16 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 50 °C 0 °C

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9/12/01
TNE733

RF AMPLIFIER

MODEL *TM3039*

Available as: TM3039, 4 Pin TO-8 (T4)
 TN3039, 4 Pin Surface Mount (SM3)
 FP3039, 4 Pin Flatpack (FP4)
 BX3039, Connectorized Housing (H1)

Features

- Low Noise: 2.5 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100 - 220 MHz	100 - 220 MHz
Gain (dB)	18	17.5 Min.
Power @ 1 dB Comp. (dBm)	+22	+19 Min.
Reverse Isolation (dB)	-19.5	- 19 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+12	+12
mA	80	87 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

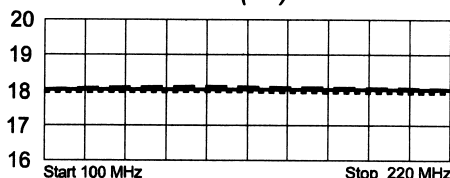
Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +38 (Typ.)

Maximum Ratings

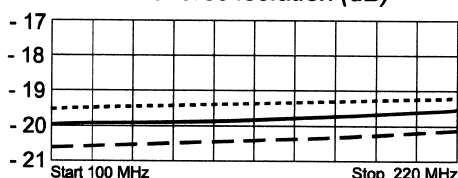
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 15 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

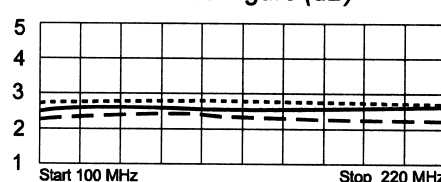
Gain (dB)



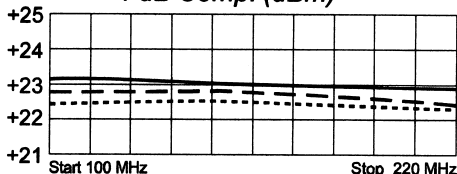
Reverse Isolation (dB)



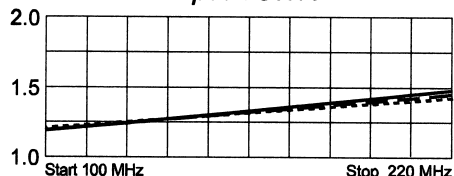
Noise Figure (dB)



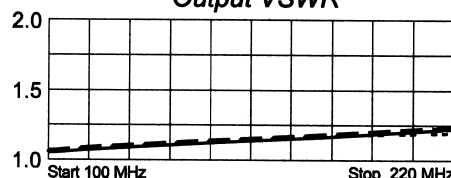
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C — — — + 85 °C - - - - - 55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.12	- 93	7.85	-162	.1005	-161	.09	- 47
10	.07	-110	8.00	-173	.1026	-173	.05	- 59
20	.05	-127	8.01	-180	.1065	180	.03	- 60
50	.04	-138	8.04	171	.1012	169	.03	- 51
100	.07	-119	8.09	158	.1044	156	.06	- 54
150	.13	-129	8.13	145	.1053	143	.07	- 63
200	.19	-150	8.05	132	.1064	131	.09	- 83
250	.24	-167	7.89	119	.1089	118	.10	-109
300	.28	178	7.58	105	.1089	107	.13	-138

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RF AMPLIFIER

MODEL *TM3040*

Available as: TM3040, 4 Pin TO-8 (T4)
 TN3040, 4 Pin Surface Mount (SM3)
 FP3040, 4 Pin Flatpack (FP4)
 BX3040, Connectorized Housing (H1)
 PN3040, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +27 dBm Typical
- High Dynamic Range: IP₃ = +39 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +54 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Specifications

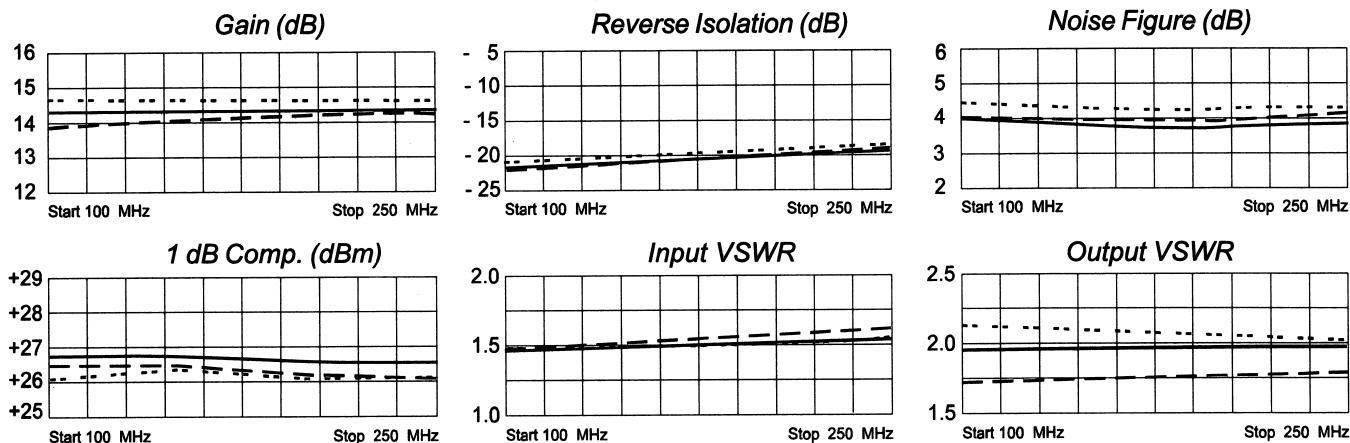
CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		100 - 250 MHz	100 - 250 MHz
Gain (dB)		14.5	13.5 Min.
Power @ 1 dB Comp. (dBm)		27	+26 Min.
Reverse Isolation (dB)		22	- 20 Max.
VSWR	In	1.6	2.0:1 Max.
	Out	1.35	2.0:1 Max.
Noise figure (dB)		4	6.0 Max.
Power	Vdc	+15	+15
	mA	110	125 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Amplifonix

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02/20/03
TME925

RF AMPLIFIER

MODEL *TM3042*

Available as: TM3042, 4 Pin TO-8 (T4)
 TN3042, 4 Pin Surface Mount (SM3)
 FP3042, 4 Pin Flatpack (FP4)
 BX3042, Connectorized Housing (H1)
 PN3042, Reduced Size Surface Mount (SM11)

Features

- High Gain: +23 dB Typ.
- Low Noise Figure: 3 dB Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1200 MHz	10 - 1200 MHz
Gain (dB)	23	21 Min.
Power @ 1 dB Comp. (dBm)	19	18 Min.
Reverse Isolation (dB)	- 30	- 28 Max.
VSWR In	1.2:1	1.7:1 Max.
Out	1.5:1	1.7:1 Max.
Noise figure (dB)	3.0	4.5 Max.
Power Vdc	+15	+15
mA	75	85 Max.

Note: Care should always be taken to effectively ground the case of each unit.

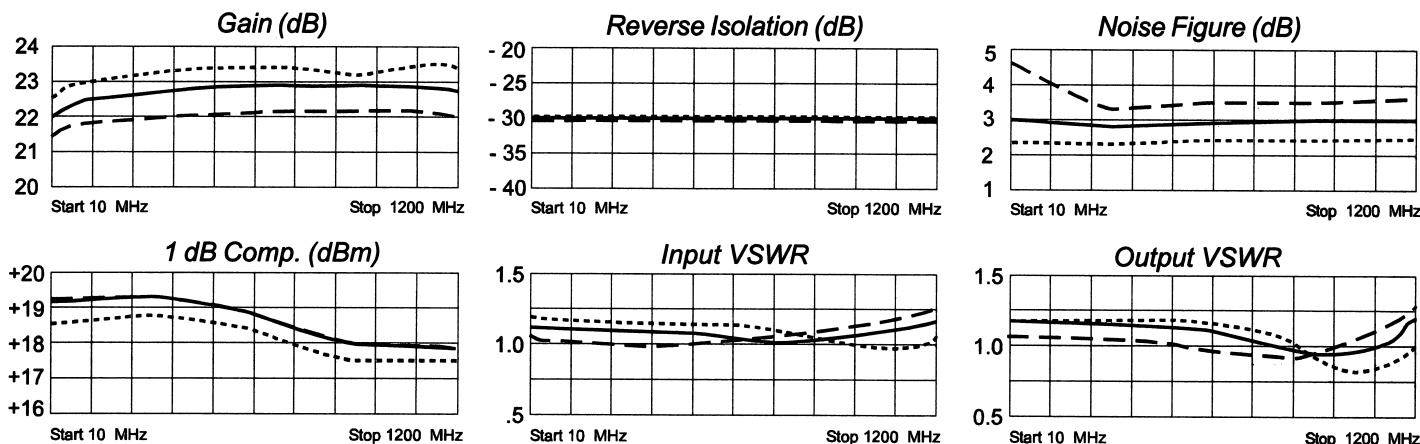
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

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SME931

RF AMPLIFIER

MODEL *TM3072*

Available as: TM3072, 4 Pin TO-8 (T4)
 TN3072, 4 PIN Surface Mount (SM3)
 FP3072, 4 Pin Flatpack (FP4)
 BX3072, Connectorized Housing (H1)

Features

- High Output Power: 27 dBm Typical
- Low Phase Bipolar Design
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	10 - 200	10 - 200
Gain (dB)	14	13 Min. 15 Max
Power @ 1 dB Comp. (dBm)	28	+26 Min
Reverse Isolation (dB)	-17	-16 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	5	6 Max.
Power Vdc	+15	+15
mA	180	185 Max.

Note: Care should always be taken to effectively ground the case of each unit.

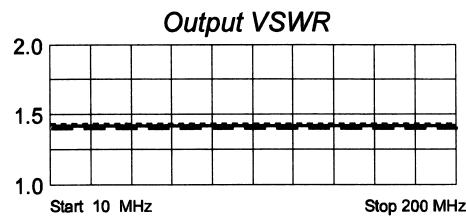
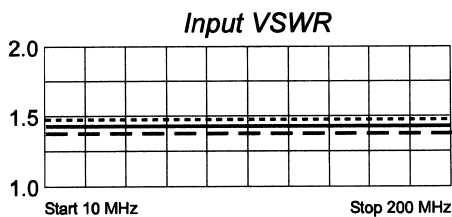
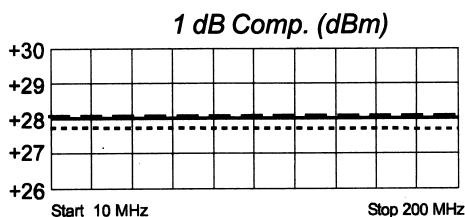
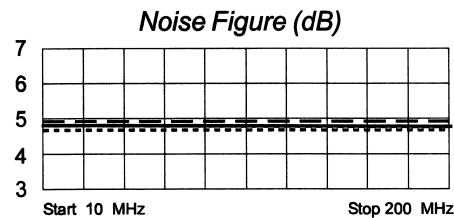
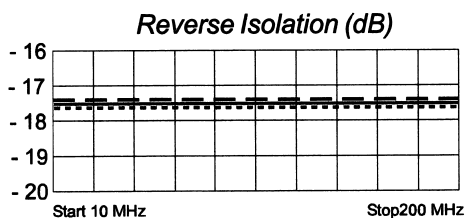
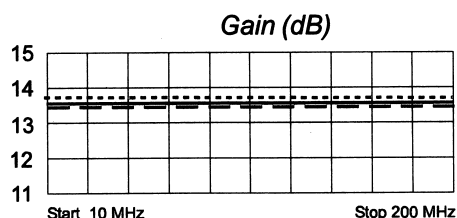
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +65 (Typ.)
 Second Order Two Tone Intercept Point +60 (Typ.)
 Third Order Two Tone Intercept Point +45 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power +15 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Amplifonix

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RF AMPLIFIER

MODEL *TM4002*

Available as: TM4002, 4 Pin TO-8 (T4)
TN4002, 4 Pin Surface Mount (SM3)
BX4002, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Power @ 1 dB Comp: 19.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	10 -500	10 - 500
Gain (dB)	+20	+19 Min.
Power @ 1 dB Comp. (dBm)	+19.5	+18.5 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	1.4:1	1.75:1 Max.
Out	1.3:1	1.75:1 Max.
Noise figure (dB)	4	5 Max.
Power Vdc	15	15
mA	80	85 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

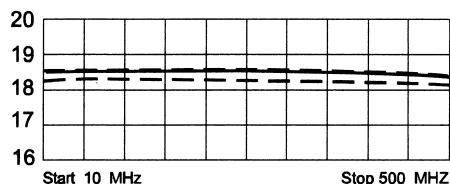
Second Order Harmonic Intercept Point +51 (Typ.)
Second Order Two Tone Intercept Point +45 (Typ.)
Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

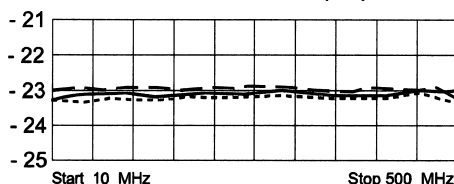
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 16 Volts
Continuous RF Input Power + 10 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data

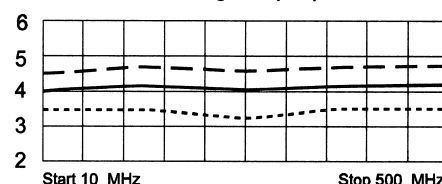
Gain (dB)



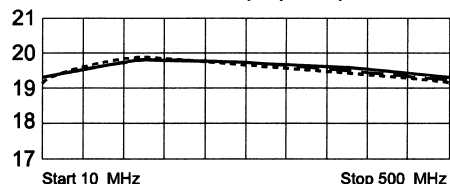
Reverse Isolation (dB)



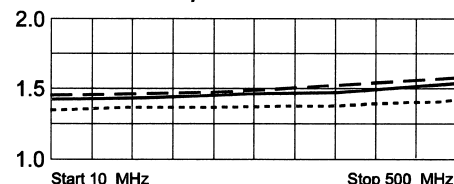
Noise Figure (dB)



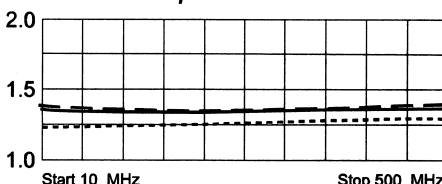
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - + 85 °C -55 °C

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RF AMPLIFIER MODEL **TM4003**

Available as: TM4003, 4 Pin TO-8 (T4)
TN4003, 4 Pin Surface Mount (SM3)
BX4003, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Power @ 1 dB Comp: + 19.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	10 -500	10 - 500
Gain (dB)	+20	+19 Min.
Power @ 1 dB Comp. (dBm)	+19.5	+18.5 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	1.4:1	1.75:1 Max.
Out	1.3:1	1.75:1 Max.
Noise figure (dB)	4	5 Max.
Power Vdc	6	6
mA	80	85 Max.

Note: Care should always be taken to effectively ground the case of each unit.

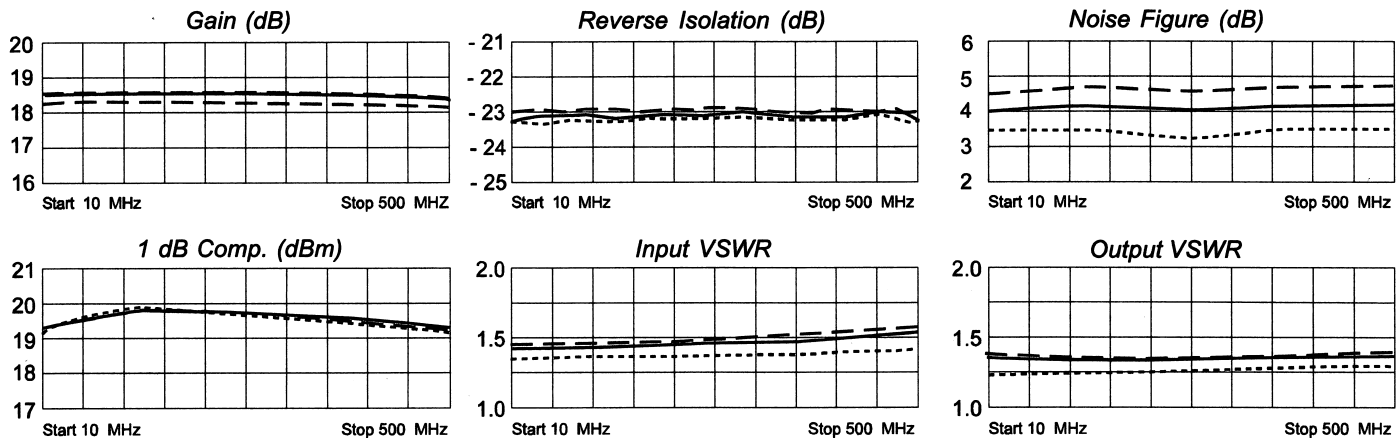
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
Second Order Two Tone Intercept Point +45 (Typ.)
Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7 Volts
Continuous RF Input Power + 10 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power.....0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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RF AMPLIFIER

MODEL *TM4172*

Available as: TM4172, 4 Pin TO-8 (T4)
 TN4172, 4 Pin Surface Mount (SM3)
 FP4172, 4 Pin Flatpack (FP4)
 BX4172, Connectorized Housing (H1)
 PN4172, Reduced Size Surface Mount (SM11)

Features

- Low Noise figure: 3.0 dB Typical
- High Output Power: +23 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 250	10 - 250
Gain (dB)	13.5	12.0 Min.
Power @ 1 dB Comp. (dBm)	+23	+21 Min.
Reverse Isolation (dB)	- 20	Max.
VSWR In	1.6:1	2.0:1 Max.
VSWR Out	1.6:1	2.0:1 Max.
Noise figure (dB)	3.0	4.0 Max.
Power Vdc	+12	+12
mA	90	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

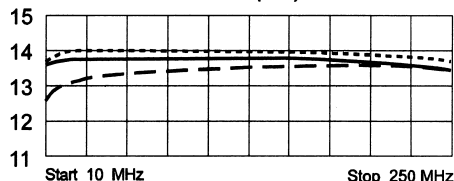
Second Order Harmonic Intercept Point +50(Typ.)
 Second Order Two Tone Intercept Point +43(Typ.)
 Third Order Two Tone Intercept Point +35(Typ.)

Maximum Ratings

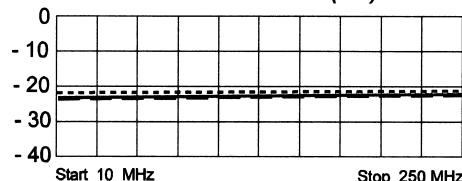
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 15 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data

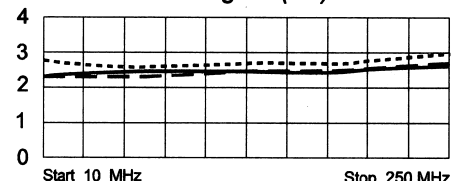
Gain (dB)



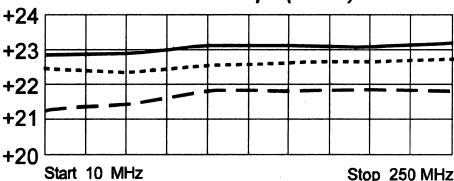
Reverse Isolation (dB)



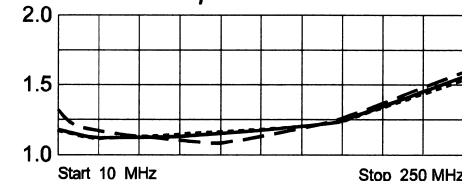
Noise Figure (dB)



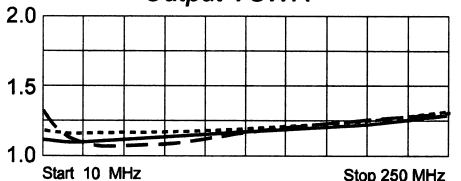
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.08	-112	4.80	-169	.0725	-171	.07	-6
50	.05	-159	4.84	168	.0731	165	.06	-21
100	.04	-139	4.86	151	.0769	149	.06	-49
150	.07	-114	4.88	135	.0797	132	.06	-81
200	.14	-120	4.87	118	.0816	114	.06	-127
250	.22	-139	4.76	100	.0854	99	.09	-163

Amplifonix

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RF AMPLIFIER

MODEL *TM5101*

Available as: TM5101, 4 Pin TO-8 (T4)
 TN5101, 4 Pin Surface Mount (SM3)
 FP5101, 4 Pin Flatpack (FP4)
 BX5101, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.75 dB Typical
- Medium Gain: 13 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	13 ±0.5	12 Min./14 Max.
Power @ 1 dB Comp. (dBm)	+7.5	+6.0 Min.
Reverse Isolation (dB)	- 15.5	- 15 Max.
VSWR In	1.25:1	2.0:1 Max.
Out	1.4:1	2.0:1 Max.
Noise figure (dB)	2.75	4.0 Max.
Power Vdc	+15	+15
mA	17	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

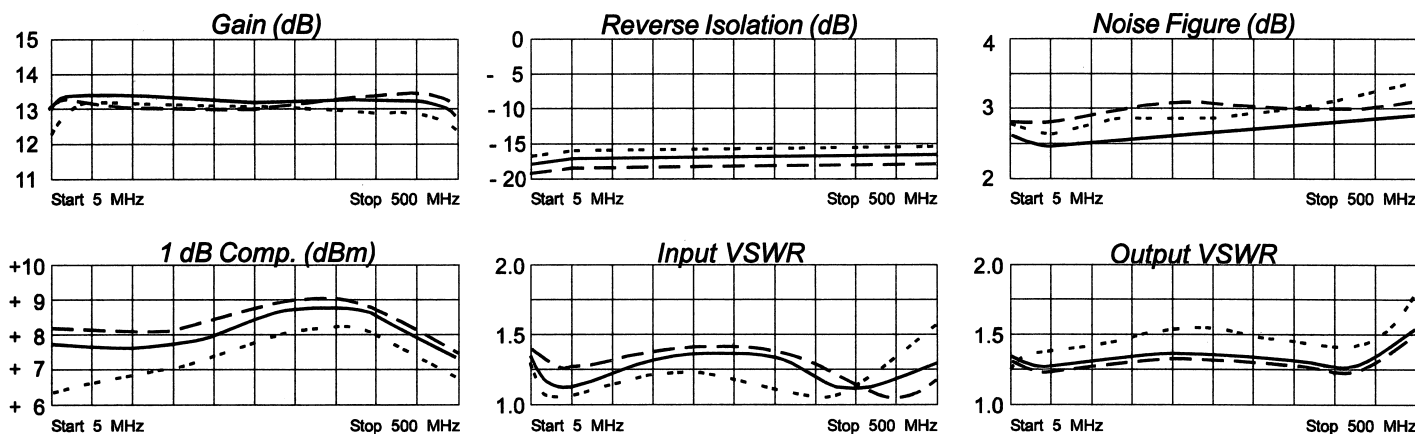
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +31 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	-48	4.53	-165	.13	-164	.15	-35
50	.08	11	4.64	167	.14	167	.12	5
100	.11	22	4.61	153	.14	150	.14	11
200	.15	8	4.58	126	.14	122	.18	-5
300	.13	-21	4.58	98	.15	94	.16	-42
400	.03	-99	4.62	66	.16	66	.12	-121
500	.16	112	4.38	32	.17	36	.26	155

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RF AMPLIFIER

MODEL *TM5102*

Available as: TM5102, 4 Pin TO-8 (T4)
TN5102, 4 Pin Surface Mount (SM3)
FP5102, 4 Pin Flatpack (FP4)
BX5102, Connectorized Housing (H1)

Features

- Medium Gain: 12.5 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		
Gain (dB)	5 - 500MHz	51.500 MHz
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.5	7.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

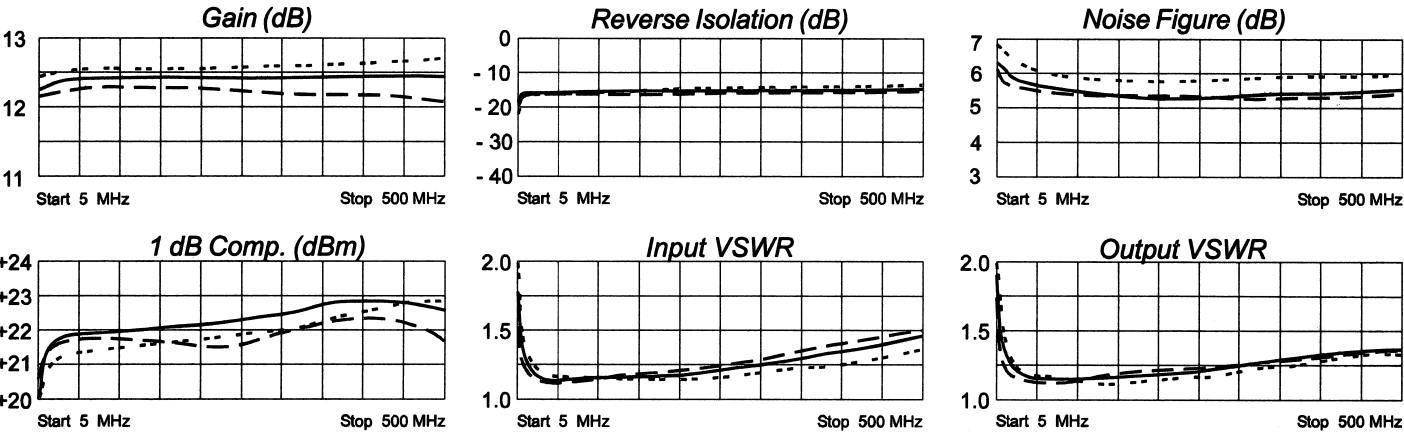
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
Second Order Two Tone Intercept Point +46 (Typ.)
Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.2 Watt
..... (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	-82	4.20	-166	.12	11	.15	115
50	.03	95	4.36	175	.13	- 2	.05	85
100	.09	62	4.31	166	.13	- 6	.08	64
200	.16	23	4.24	150	.14	-14	.13	30
300	.21	-10	4.23	89	.15	-24	.16	- 4
400	.23	-42	4.27	58	.15	-35	.16	-43
500	.17	-75	4.35	24	.16	-47	.13	-94

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RF AMPLIFIER

MODEL *TM5103*

Available as: TM5103, 4 Pin TO-8 (T4)
 TN5103, 4 Pin Surface Mount (SM3)
 FP5103, 4 Pin Flatpack (FP4)
 BX5103, Connectorized Housing (H1)

Features

- High Third Order Intercept: +36 dBm Typical
- High Output Power: +23 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+23	+21.0 Min.
Reverse Isolation (dB)	- 14.5	- 14 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	5.0	6.5 Max.
Power Vdc	+15	+15
mA	85	92 Max.

Note: Care should always be taken to effectively ground the case of each unit.

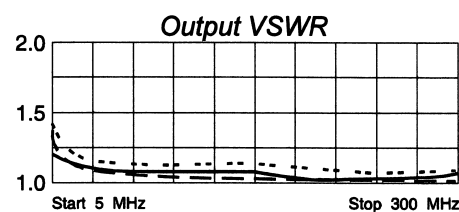
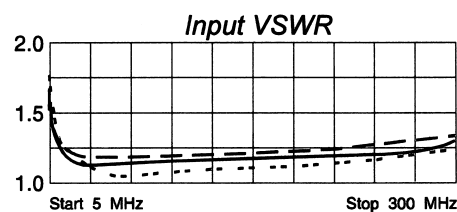
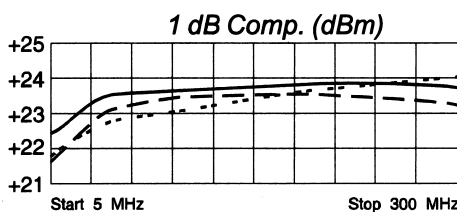
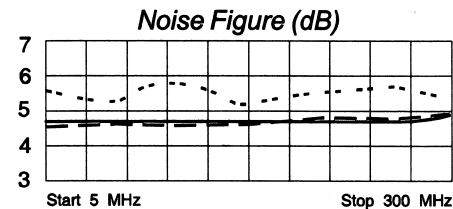
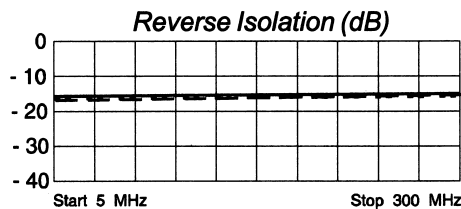
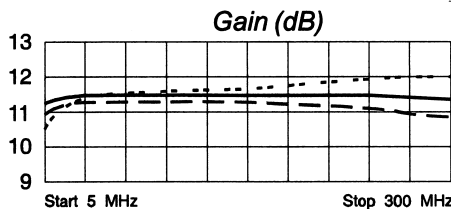
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-65	3.63	-160	.15	10	.10	81
10	.12	-63	3.73	-171	.15	5	.06	61
25	.06	-48	3.78	178	.15	3	.04	29
50	.04	-26	3.80	169	.15	2	.04	6
100	.05	-13	3.81	155	.16	3	.04	-23
150	.07	-20	3.84	141	.16	3	.03	-51
200	.09	-34	3.85	127	.17	3	.03	-88
250	.11	-50	3.85	113	.18	2	.03	-147
300	.13	-68	3.80	97	.19	1	.05	159
350	.15	-88	3.67	80	.20	-1	.08	126
400	.15	-108	3.42	63	.20	-5	.12	98

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RF AMPLIFIER MODEL *TM5104*

Available as: TM5104, 4 Pin TO-8 (T4)
TN5104, 4 Pin Surface Mount (SM3)
FP5104, 4 Pin Flatpack (FP4)
BX5104, Connectorized Housing (H1)

Features

- Low Noise: 2dB Typical
- High Dynamic Range: +32dBm Typical IP₃
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	12.0	10.5 Min.
Power @ 1 dB Comp. (dBm)	+15.0	+13.0 Min.
Reverse Isolation (dB)	- 15.5	- 14.5 Max.
VSWR In	1.35:1	2.0:1 Max.
Out	1.50:1	2.0:1 Max.
Noise figure (dB)	2.0	3.5 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

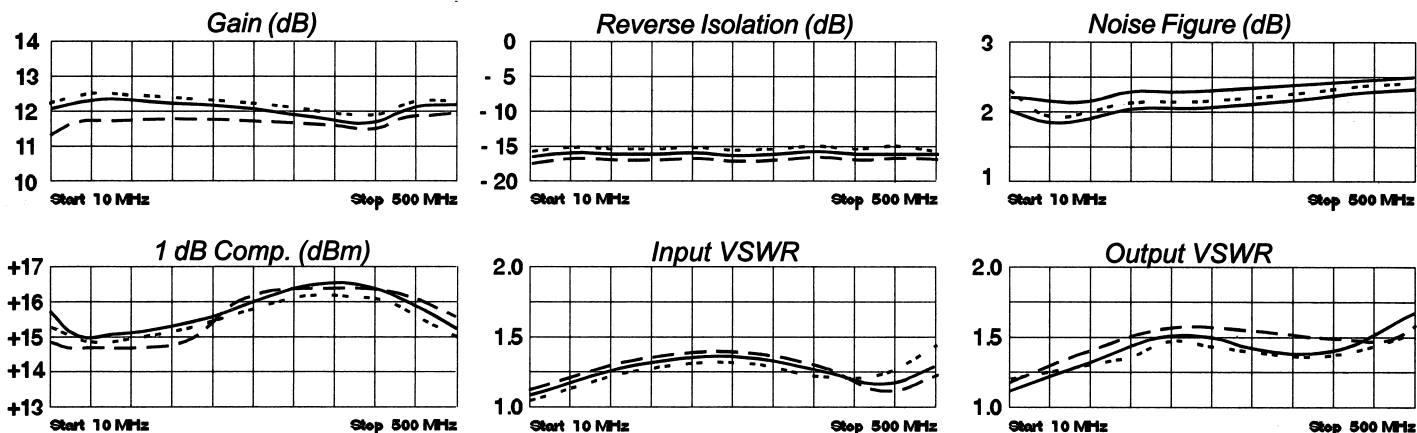
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52(Typ.)
Second Order Two Tone Intercept Point +46(Typ.)
Third Order Two Tone Intercept Point +32(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 100 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.2 Watt
(3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.07	-114	4.04	-161	.16	-160	.06	-115
10	.03	-144	4.18	-171	.17	-171	.03	-152
50	.04	112	4.21	174	.17	173	.04	122
100	.08	89	4.19	165	.17	163	.07	92
200	.16	60	4.17	148	.17	145	.13	56
300	.20	36	4.17	132	.17	129	.18	29
400	.23	15	4.25	116	.17	114	.22	5
500	.21	- 5	4.26	98	.18	99	.25	- 19

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RF AMPLIFIER

MODEL *TM5105*

Available as: TM5105, 4 Pin TO-8 (T4)
 TN5105, 4 Pin Surface Mount (SM3)
 FP5105, 4 Pin Flatpack (FP4)
 BX5105, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.75 dB Typical
- Medium Gain: 12 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	12	11.0 Min.
Power @ 1 dB Comp. (dBm)	+7	+5.5 Min.
Reverse Isolation (dB)	- 18.5	- 16 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.6:1	2.0:1 Max.
Noise figure (dB)	<2.75	4.0 Max.
Power Vdc	+15	+15
mA	17	19 Max.

Note: Care should always be taken to effectively ground the case of each unit.

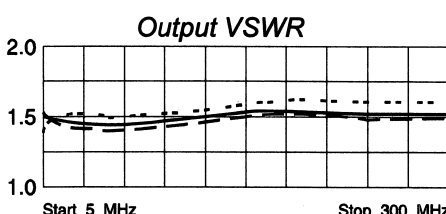
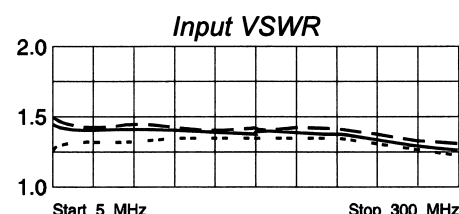
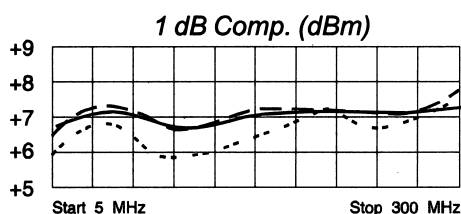
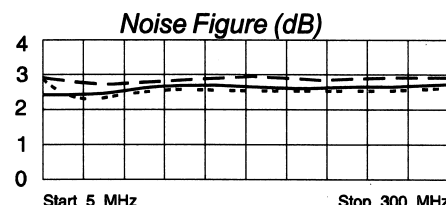
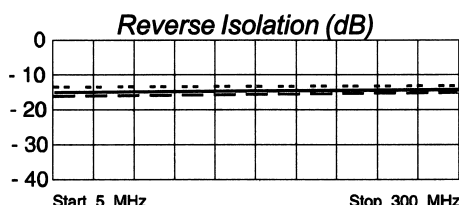
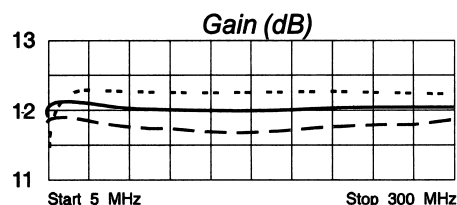
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +35(Typ.)
 Second Order Two Tone Intercept Point +29(Typ.)
 Third Order Two Tone Intercept Point +21(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.19	-15	3.93	-165	.11	-165	.21	-10
10	.18	-9	4.02	-174	.12	-175	.21	-6
50	.17	-9	4.00	168	.12	168	.20	-8
100	.16	-13	3.99	155	.12	154	.20	-14
200	.15	-31	4.00	128	.12	128	.22	-34
300	.12	-66	4.03	101	.12	102	.22	-68
400	.10	-145	4.04	72	.12	75	.23	-116

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RF AMPLIFIER

MODEL *TM5107*

Available as: TM5107, 4 Pin TO-8 (T4)
 TN5107, 4 Pin Surface Mount (SM3)
 FP5107, 4 Pin Flatpack (FP4)
 BX5107, Connectorized Housing (H1)

Features

- Low Noise Figure: < 1.75 dB Typical
- Medium Gain: 15 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 550 MHz	10 - 550 MHz
Gain (dB)	15.0	14.0 Min.
Power @ 1 dB Comp. (dBm)	>+2	+1.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<1.75	2.3 Max.
Power Vdc	+15	+15
mA	9.0	10.0 Max.

Note: Care should always be taken to effectively ground the case of each unit.

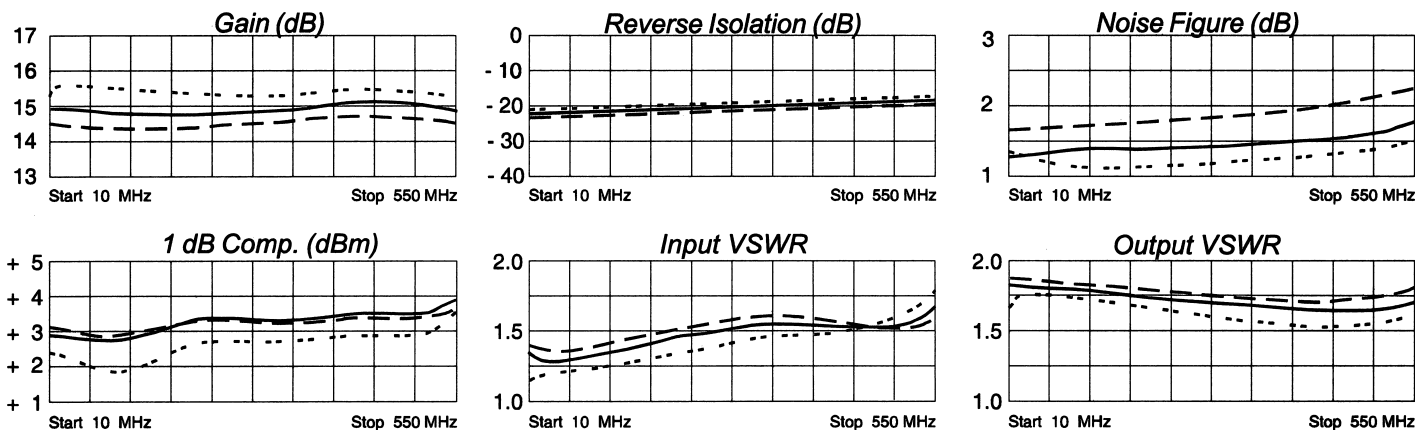
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +22 (Typ.)
 Second Order Two Tone Intercept Point +16 (Typ.)
 Third Order Two Tone Intercept Point +13 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	-----S11----- Mag Deg	-----S21----- Mag Deg	-----S12----- Mag Deg	-----S22----- Mag Deg
10	.14 - 29	5.70 -176	.09 -176	.29 - 11
50	.13 - 40	5.63 167	.09 166	.28 - 14
100	.15 - 64	5.59 154	.09 151	.27 - 23
200	.20 -106	5.54 127	.09 124	.26 - 44
300	.24 -143	5.49 101	.09 95	.25 - 67
400	.26 176	5.57 72	.10 69	.25 - 92
500	.26 117	5.56 41	.10 40	.26 -125
550	.28 80	5.47 23	.10 27	.27 -146

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RF AMPLIFIER

MODEL *TM5109*

Available as: TM5109, 4 Pin TO-8 (T4)
 TN5109, 4 Pin Surface Mount (SM3)
 FP5109, 4 Pin Flatpack (FP4)
 BX5109, Connectorized Housing (H1)

Features

- Medium Gain: 10.6 dB Typical
- Medium Output Power: +12.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	10.5	9.5 Min.
Power @ 1 dB Comp. (dBm)	+13	+12.0 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.0 Max.
Power Vdc mA	+15 35	+15 38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

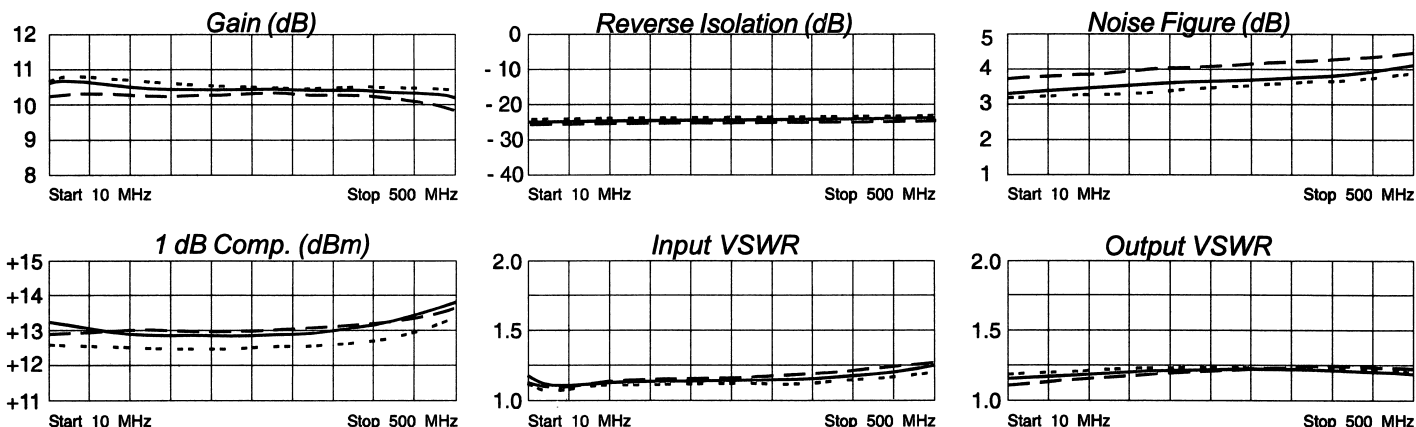
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	- 61	3.35	-168	.05	-167	.09	- 22
10	.06	- 54	3.42	-176	.05	-176	.08	- 13
50	.04	- 30	3.39	165	.05	163	.08	- 22
100	.03	- 35	3.39	148	.05	145	.08	- 42
200	.04	- 54	3.40	116	.06	109	.08	- 73
300	.06	- 98	3.49	82	.06	77	.09	-101
400	.08	-146	3.51	44	.06	45	.07	-122
500	.13	162	3.34	3	.06	11	.06	-115
600	.18	104	2.89	- 41	.06	- 25	.08	- 88

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RF AMPLIFIER

MODEL *TM5110*

Available as: TM5110, 4 Pin TO-8 (T4)
 TN5110, 4 Pin Surface Mount (SM3)
 FP5110, 4 Pin Flatpack (FP4)
 BX5110, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.5 dB Typical
- Medium Gain: 15 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	10 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+10.5	+9.0 Min.
Reverse Isolation (dB)	- 21	- 20 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+15	+15
mA	25	27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

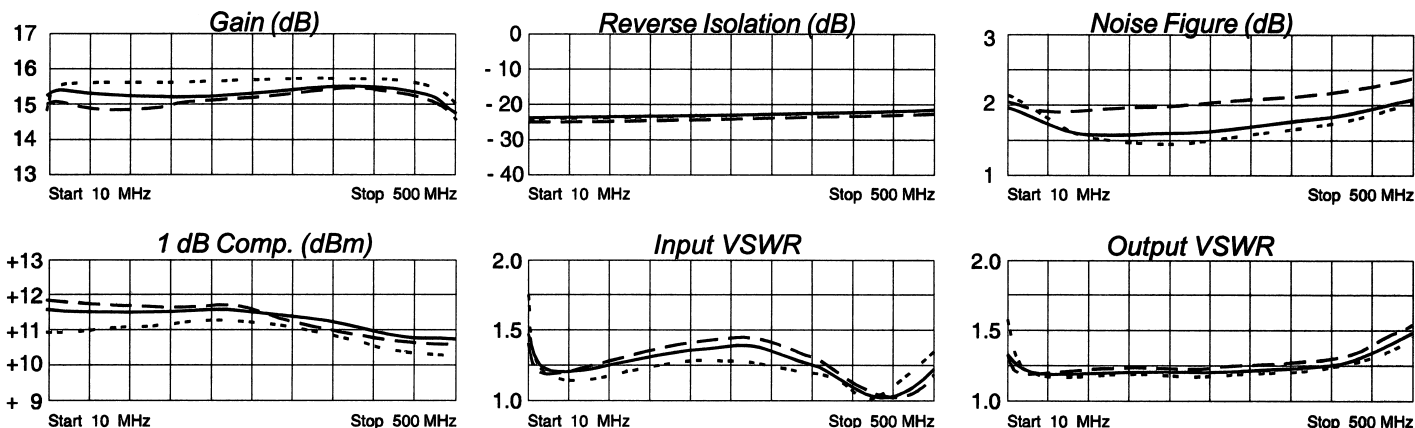
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.25	- 51	5.61	-161	.07	-164	.21	- 44
10	.15	- 41	5.79	-173	.08	-175	.14	- 36
50	.09	- 26	5.80	163	.08	160	.10	- 17
100	.11	- 33	5.78	144	.08	140	.10	- 19
200	.14	- 62	5.81	106	.08	99	.09	- 35
300	.14	- 97	5.89	66	.08	62	.10	- 71
400	.06	-125	5.93	22	.09	25	.13	-130
500	.11	- 11	5.48	- 27	.09	- 13	.21	168

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RF AMPLIFIER

MODEL *TM5118*

Available as: TM5118, 4 Pin TO-8 (T4)
 TN5118, 4 Pin Surface Mount (SM3)
 FP5118, 4 Pin Flatpack (FP4)
 BX5118, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.6 dB Typical
- Medium Gain: 16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	3 - 100 MHz	3 - 100 MHz
Gain (dB)	16.3	15.5 Min.
Power @ 1 dB Comp. (dBm)	+6.5	+5.5 Min.
Reverse Isolation (dB)	- 28.5	- 28 Max.
VSWR In	<1.75:1	2.5:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	1.5	2.0 Max.
Power Vdc	+15	+15 Max.
mA	21	24 Max.

Note: Care should always be taken to effectively ground the case of each unit.

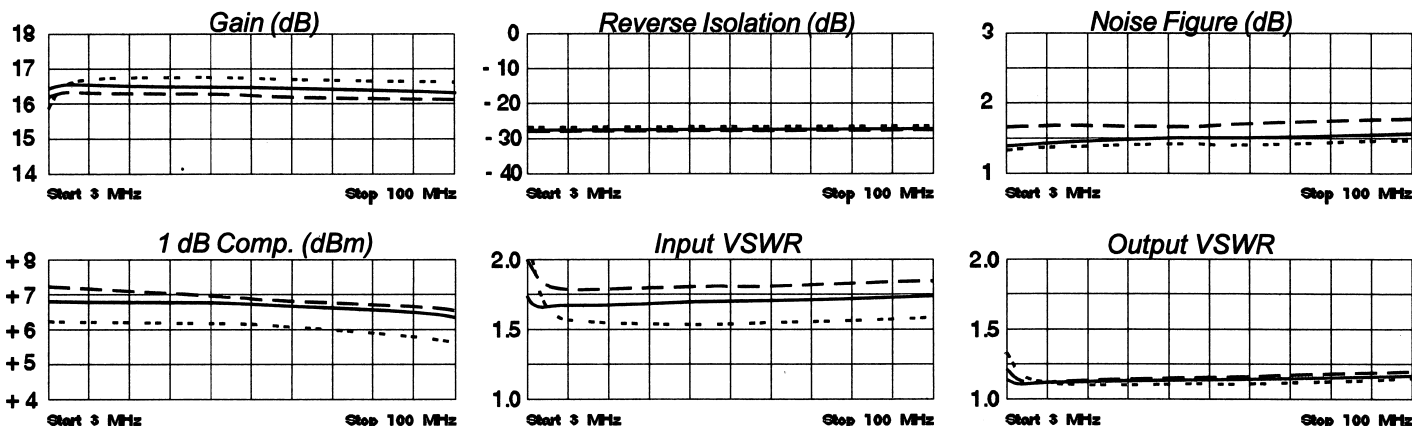
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +31 (Typ.)
 Second Order Two Tone Intercept Point +25 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11 Mag	S11 Deg	S21 Mag	S21 Deg	S12 Mag	S12 Deg	S22 Mag	S22 Deg
3	.29	-14	6.47	-173	.03	-173	.05	-39
10	.27	-5	6.56	179	.03	178	.04	-6
25	.28	-6	6.55	172	.03	171	.04	12
50	.28	-10	6.48	164	.03	161	.06	24
100	.28	-22	6.45	148	.04	143	.08	27
200	.28	-65	6.46	113	.04	110	.11	10

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RF AMPLIFIER

MODEL *TM5119*

Available as: TM5119, 4 Pin TO-8 (T4)
 TN5119, 4 Pin Surface Mount (SM3)
 FP5119, 4 Pin Flatpack (FP4)
 BX5119, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.25 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+14 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.25	3.0 Max.
Power Vdc	+15	+15
mA	30	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

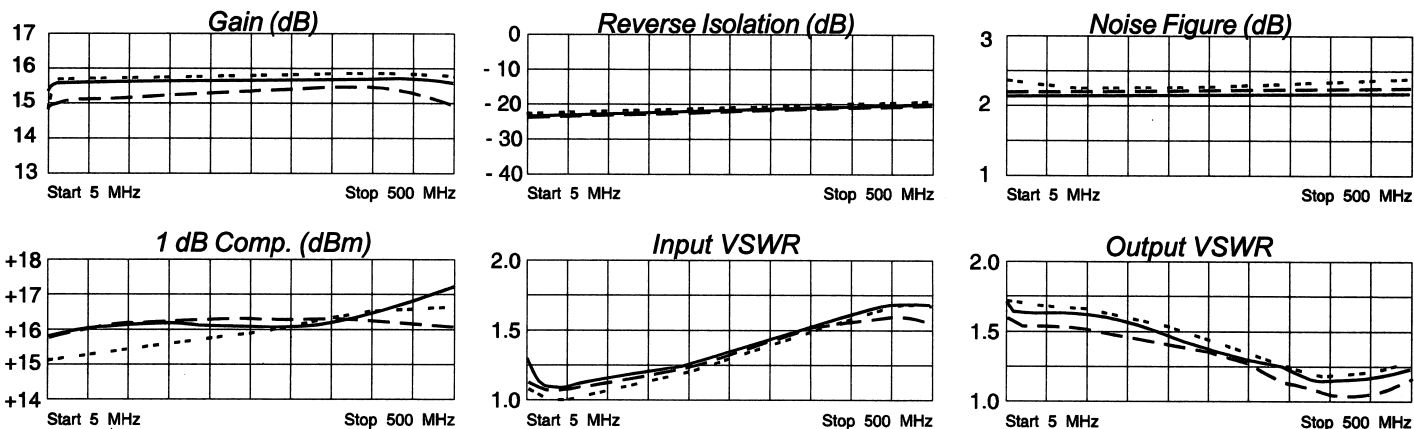
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	- 57	5.84	-164	.09	-163	.26	- 14
50	.05	- 29	6.00	169	.09	168	.24	- 12
100	.06	- 41	6.00	157	.10	151	.23	- 22
200	.11	- 66	6.04	132	.10	123	.19	- 44
300	.18	-100	6.13	106	.11	98	.12	- 77
400	.23	-139	6.12	78	.11	75	.05	-150
500	.26	178	5.89	48	.11	52	.12	104

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RF AMPLIFIER

MODEL *TM5124*

Available as: TM5124, 4 Pin TO-8 (T4)
 TN5124, 4 Pin Surface Mount (SM3)
 FP5124, 4 Pin Flatpack (FP4)
 BX5124, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- High Output Power: +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 200 MHz	20 - 200 MHz
Gain (dB)	20.5	19.5 Min.
Power @ 1 dB Comp. (dBm)	+20	+18 Min.
Reverse Isolation (dB)	- 24	- 23.5 Max.
VSWR In	1.5:1	1.6:1 Max.
Out	1.2:1	1.6:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	53	58 Max.

Note: Care should always be taken to effectively ground the case of each unit.

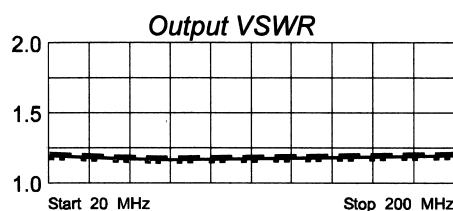
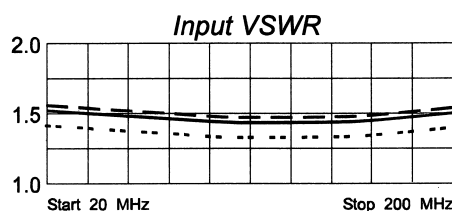
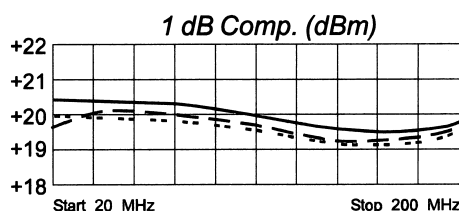
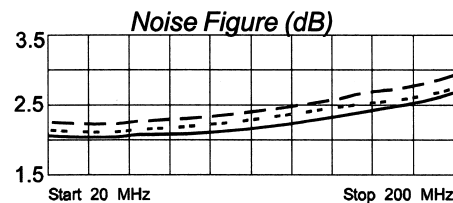
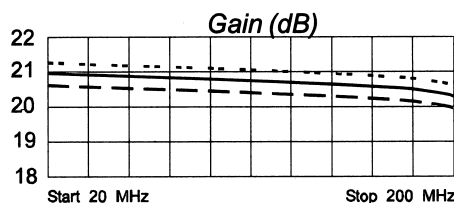
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.21	- 38	11.43	177	.06	178	.10	- 42
50	.21	- 60	11.40	158	.06	156	.08	- 25
100	.23	-104	11.18	133	.06	131	.08	- 25
150	.25	-150	10.94	109	.06	107	.10	- 36
200	.26	158	10.58	82	.06	83	.13	- 64

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RF AMPLIFIER

MODEL *TM5125*

Available as: TM5125, 4 Pin TO-8 (T4)
 TN5125, 4 Pin Surface Mount (SM3)
 FP5125, 4 Pin Flatpack (FP4)
 BX5125, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- High Power: +24 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	20.5	19.5 Min./21 Max.
Power @ 1 dB Comp. (dBm)	+24	+22.5 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	1.7:1	2.2:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	80	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

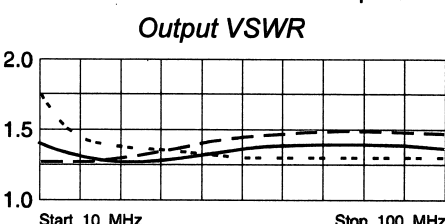
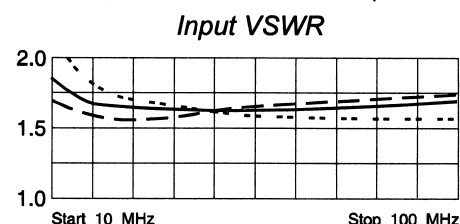
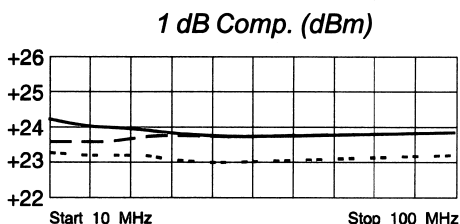
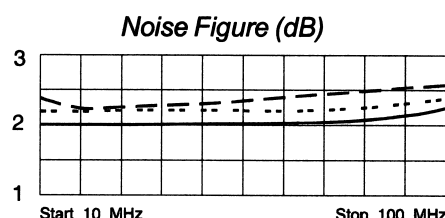
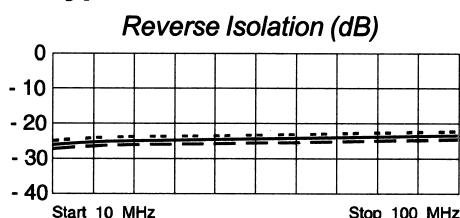
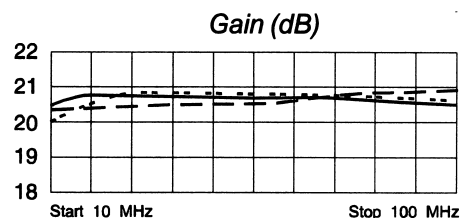
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.39	-32.94	9.94	-151.50	.05	-151.80	.26	-19.89
10	.29	-26.29	10.56	-168.32	.05	-172.06	.15	-23.55
25	.26	-20.09	10.79	176.24	.05	169.91	.12	8.61
50	.25	-25.12	10.79	162.45	.05	154.52	.17	18.79
75	.26	-34.68	10.69	150.84	.06	139.83	.20	15.63
100	.27	-46.93	10.52	140.02	.06	126.88	.22	8.47

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3/12/03

RF AMPLIFIER

MODEL *TM5125PM*

Available as: TM5125PM, 4 Pin TO-8 (T4)
 TN5125PM, 4 Pin Surface Mount (SM3)
 BX5125PM, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- High Power: +24 dBm Typical
- Low Noise: 2.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	20.5	19.5 Min./21 Max.
Power @ 1 dB Comp. (dBm)	+24.0	+22.5 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	1.7:1	2.0:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	80	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

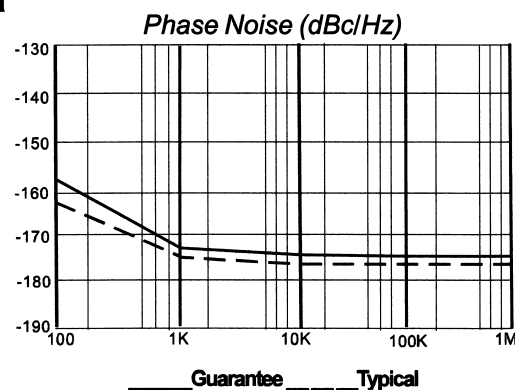
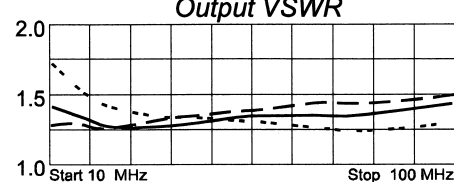
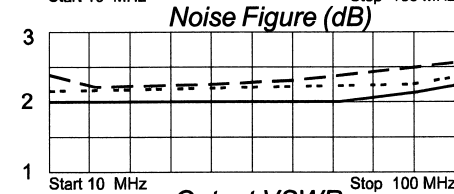
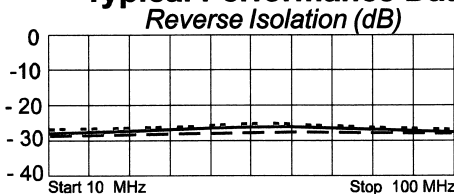
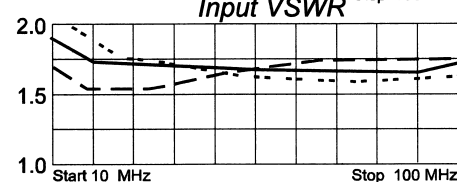
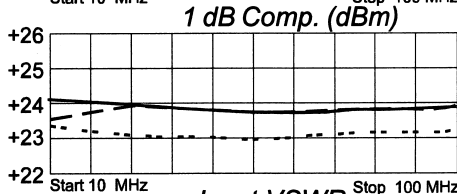
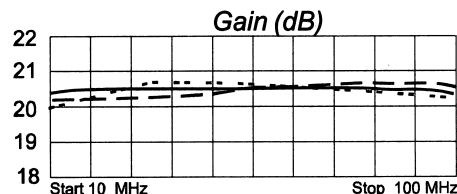
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	- 162	-158
1 KHz	- 175	-172
10 KHz	- 176	-174
100 KHz	- 176	-174
1 MHz	- 176	-174

Typical Performance Data



*Phase Noise Test Conditions:

- Carrier Frequency: 80 mHz
- Power Output: +24 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.39	-32.94	9.94	-151.50	.05	-151.80	.26	-19.89
10	.29	-26.29	10.56	-168.32	.05	-172.06	.15	-23.55
20	.26	-20.09	10.79	176.24	.05	169.91	.12	8.61
50	.25	-25.12	10.79	162.45	.05	154.52	.17	18.79
75	.26	-34.68	10.69	150.84	.06	139.83	.20	15.63
100	.27	-46.93	10.52	140.02	.06	126.88	.22	8.47

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03/11/03

RF AMPLIFIER

MODEL *TM5126*

Available as: TM5126, 4 Pin TO-8 (T4)
 TN5126, 4 Pin Surface Mount (SM3)
 FP5126, 4 Pin Flatpack (FP4)
 BX5126, Connectorized Housing (H1)

Features

- High Gain: 16.5 dB Typical
- Medium Output Power: +17 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+17	+16.0 Min.
Reverse Isolation (dB)	- 21	- 20 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	3.5 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

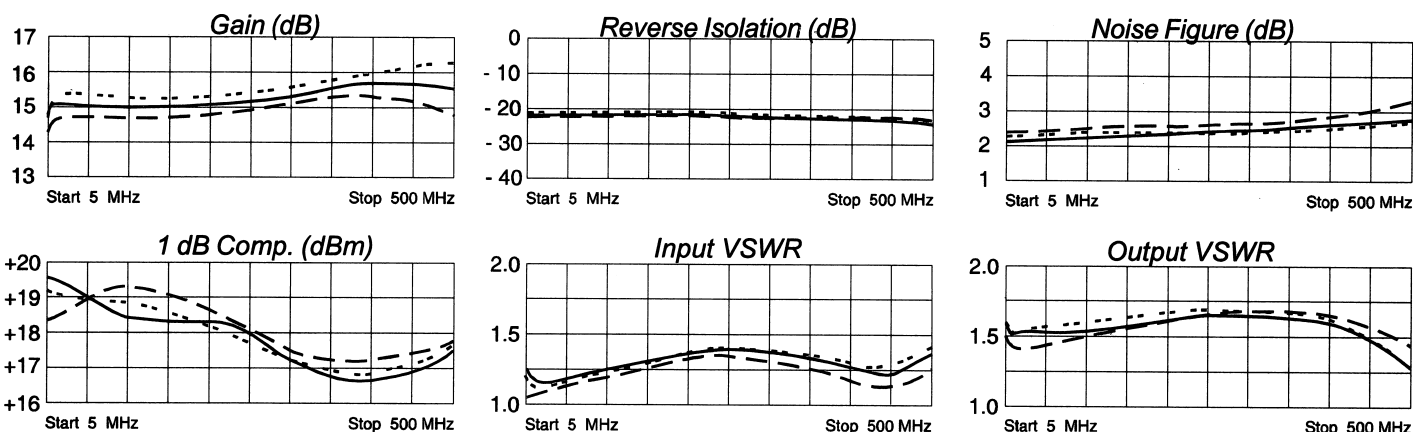
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	- 46	5.48	-166	.09	-165	.22	- 9
10	.08	- 38	5.58	-175	.09	-175	.21	- 9
50	.08	- 60	5.57	164	.09	163	.21	- 25
100	.11	- 93	5.53	146	.08	144	.21	- 48
200	.14	-145	5.54	112	.08	109	.22	- 87
300	.15	169	5.78	76	.08	73	.23	-121
400	.12	111	6.08	35	.07	35	.21	-150
500	.15	45	6.08	- 16	.06	- 3	.13	-172
600	.31	- 7	4.83	- 75	.04	- 46	.15	- 98

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RF AMPLIFIER MODEL *TM5131*

Available as: TM5131, 4 Pin TO-8 (T4)
TN5131, 4 Pin Surface Mount (SM3)
FP5131, 4 Pin Flatpack (FP4)
BX5131, Connectorized Housing (H1)

Features

- High Gain: 18 dB Gain Typical
- Medium Noise Figure: <5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1300 MHz	5 - 1300 MHz
Gain (dB)	18	17.0 Min.
Power @ 1 dB Comp. (dBm)	>+7.5	+6.0 Min.
Reverse Isolation (dB)	<- 29	- 27 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.6:1	2.0:1 Max.
Noise figure (dB)	< 5	5.5 Max.
Power Vdc	+15	+15
mA	40	44 Max.

Note: Care should always be taken to effectively ground the case of each unit.

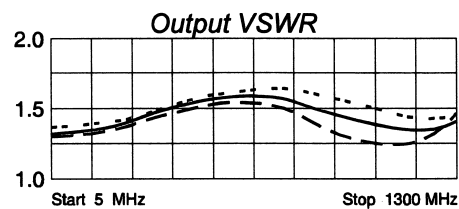
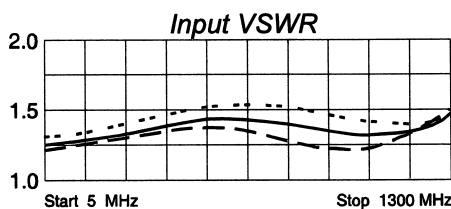
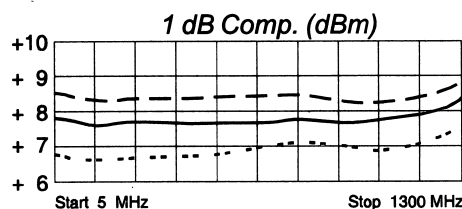
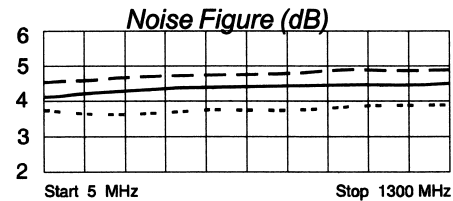
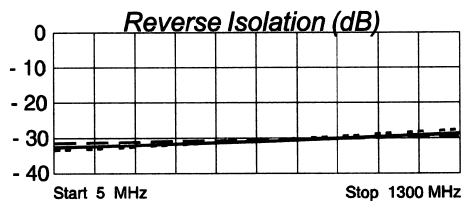
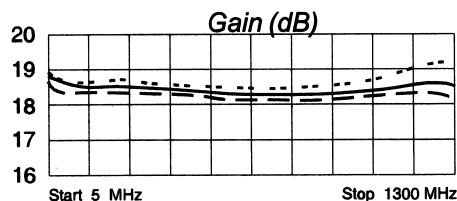
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +46 (Typ.)
Second Order Two Tone Intercept Point +40 (Typ.)
Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.08	-166	8.72	3	.03	5	.13	-172
10	.08	-171	8.67	0	.03	3	.13	-175
50	.08	-171	8.46	-9	.02	-4	.14	-174
100	.09	-169	8.48	-18	.03	-0	.14	-170
300	.13	-169	8.38	-54	.02	-6	.19	-168
500	.16	174	8.24	-90	.02	-11	.24	176
700	.16	146	8.17	-125	.03	-22	.25	153
900	.13	108	8.28	-160	.03	-31	.22	124
1100	.10	38	8.37	163	.03	-49	.17	74
1300	.16	-47	8.54	124	.03	-75	.19	-4
1500	.29	-96	8.38	84	.04	-103	.30	-63

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RF AMPLIFIER

MODEL *TM5133*

Available as: TM5133, 4 Pin TO-8 (T4)
 TN5133, 4 Pin Surface Mount (SM3)
 FP5133, 4 Pin Flatpack (FP4)
 BX5133, Connectorized Housing (H1)

Features

- High Reverse Isolation: 22 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	10	9.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.5 Min.
Reverse Isolation (dB)	- 22	- 21 Max.
VSWR In	1.75:1	2.0:1 Max.
Out	1.2:1	2.0:1 Max.
Noise figure (dB)	3.3	4.5 Max.
Power Vdc	+15	+15
mA	57	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

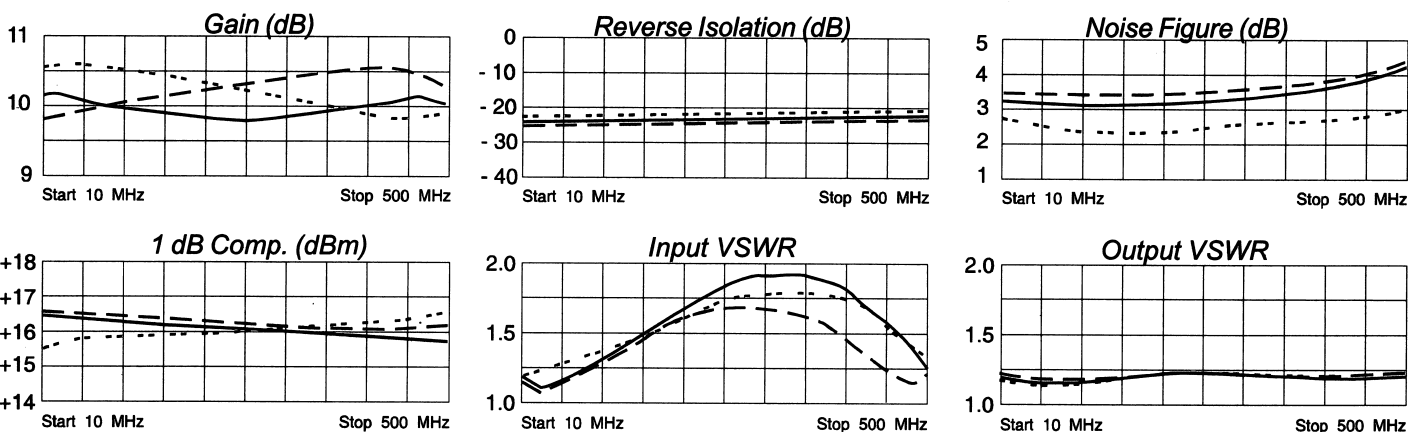
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.12	- 37	3.33	-173	.07	-175	.10	-160
50	.11	- 51	3.32	165	.07	164	.10	171
100	.16	- 76	3.28	148	.07	145	.09	151
200	.25	-110	3.22	116	.07	110	.09	115
300	.30	-136	3.18	84	.07	78	.06	75
400	.27	-167	3.28	49	.08	42	.03	- 18
500	.09	122	3.33	6	.09	5	.09	-145

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001 3/12/03

RF AMPLIFIER

MODEL *TM5137*

Available as: TM5137, 4 Pin TO-8 (T4)
 TN5137, 4 Pin Surface Mount (SM3)
 FP5137, 4 Pin Flatpack (FP4)
 BX5137, Connectorized Housing (H1)

Features

- High Out put Power: +22.5 dBm Typical
- High Third Order Intercept: +39
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 200 MHz	10 - 200 MHz
Gain (dB)	12.7	12.7 ± 0.5
Power @ 1 dB Comp. (dBm)	+22.5	+20.5 Min.
Reverse Isolation (dB)	- 18	-17.0 Max.
VSWR In	<1.6:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.2 Max.
Power Vdc	+15	+15
mA	75	80 Max.

Note: Care should always be taken to effectively ground the case of each unit.

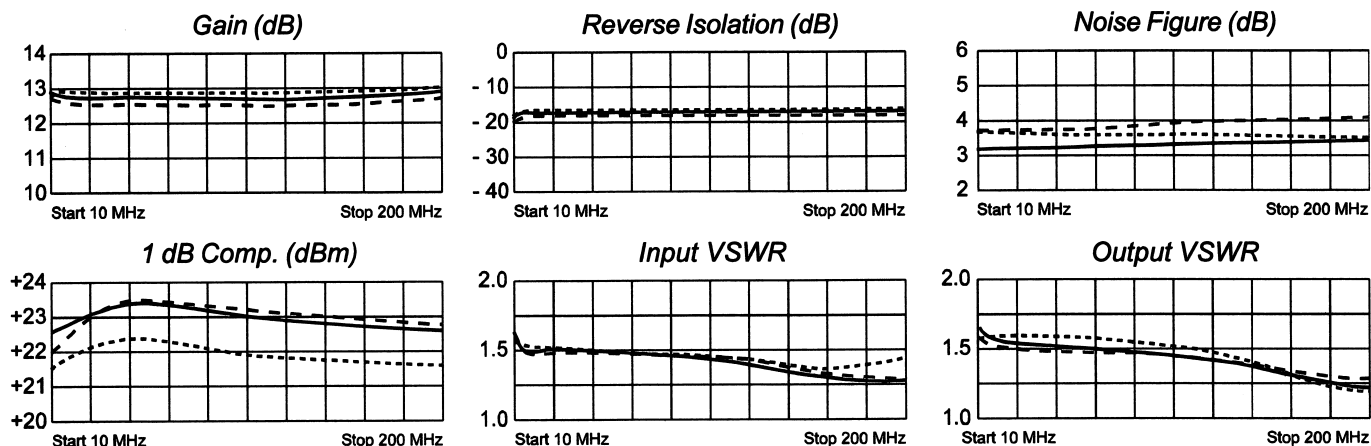
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +53 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.22	-144	4.38	-175	.12	-179	.26	- 12
40	.19	-167	4.33	164	.12	162	.23	- 31
50	.19	-169	4.33	158	.12	157	.23	- 38
100	.17	-169	4.32	135	.12	133	.21	- 68
150	.14	-159	4.37	111	.12	110	.17	- 89
200	.14	-127	4.43	85	.13	86	.12	- 85

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2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 08/27/01

RF AMPLIFIER

MODEL *TM5138*

Available as: TM5138, 4 Pin TO-8 (T4)
TN5138-3, 4 Pin Surface Mount (SM3)
FP5138-4, 4 Pin Flatpack (FP4)
BX5138, Connectorized Housing (H1)

Features

- High Output Power: +23.0 dBm Typical
- Low Noise Figure: 3.3 dB Typical
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 150 MHz	5 - 150 MHz
Gain (dB)	15.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+23.0	+21.0 Min.
Reverse Isolation (dB)	- 27	- 26 Max.
VSWR In	<1.6:1	1.8:1 Max.
Out	<1.6:1	1.8:1 Max.
Noise figure (dB)	3.3	4.0 Max.
Power Vdc	+15	+15
mA	90	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

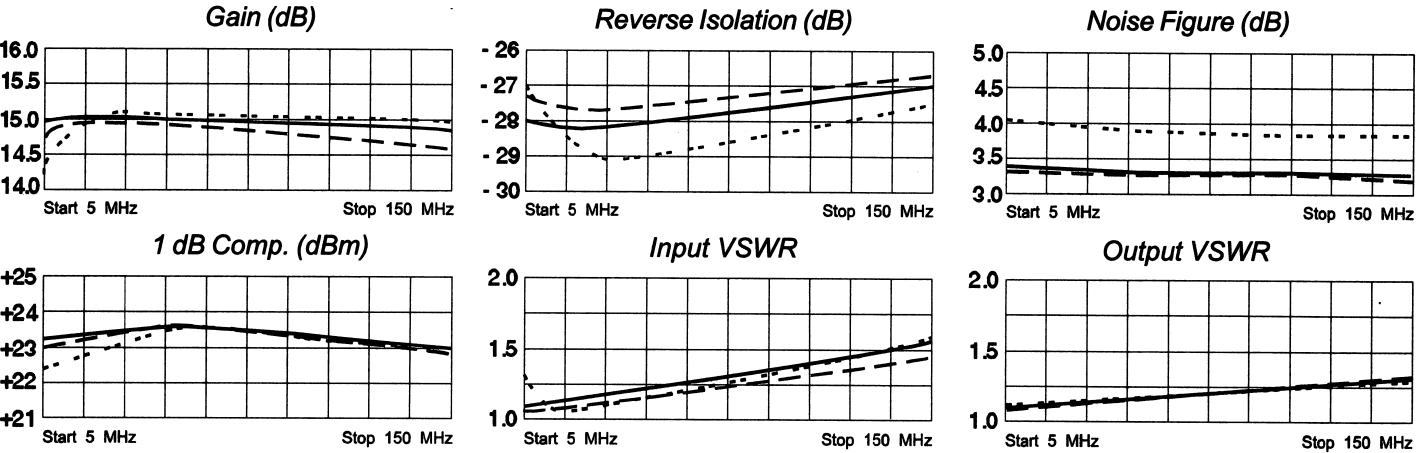
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +60 (Typ.)
Second Order Two Tone Intercept Point +55 (Typ.)
Third Order Two Tone Intercept Point +38 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power.....0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C



2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 FAX 215-464-4001 02/14/03

RF AMPLIFIER

MODEL *TM5138PM*

Available as: TM5125PM, 4 Pin TO-8 (T4)
 TN5125PM, 4 Pin Surface Mount (SM3)
 BX5125PM, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- High Power: +24 dBm Typical
- Low Noise: 2.0 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	20.5	19.5 Min./21 Max.
Power @ 1 dB Comp. (dBm)	+24.0	+22.5 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	1.7:1	2.0:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	80	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

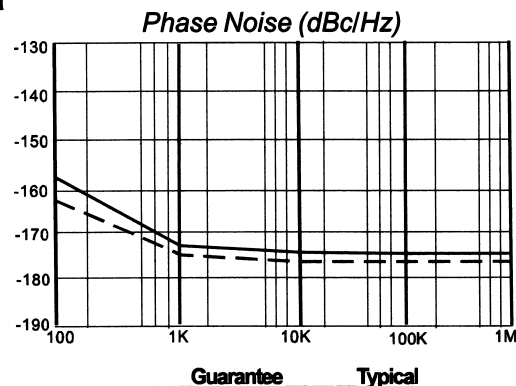
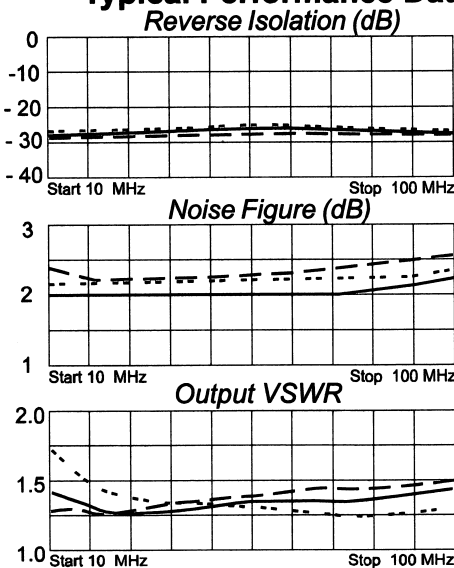
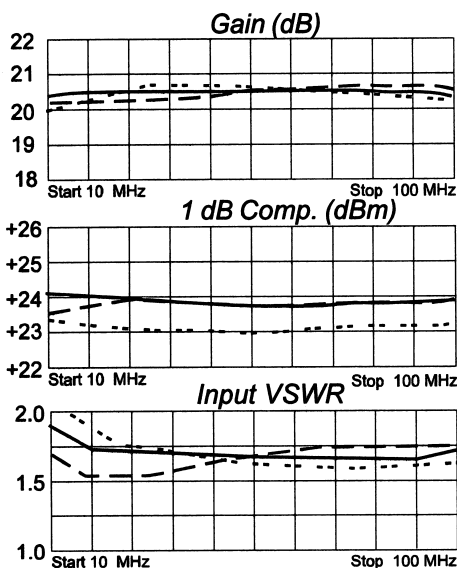
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	- 158	-154
1 KHz	- 163	-160
10 KHz	- 176	-174
100 KHz	- 176	-174
1 MHz	- 176	-174

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.39	-32.94	9.94	-151.50	.05	-151.80	.26	-19.89
10	.29	-26.29	10.56	-168.32	.05	-172.06	.15	-23.55
20	.26	-20.09	10.79	176.24	.05	169.91	.12	8.61
50	.25	-25.12	10.79	162.45	.05	154.52	.17	18.79
75	.26	-34.68	10.69	150.84	.06	139.83	.20	15.63
100	.27	-46.93	10.52	140.02	.06	126.88	.22	8.47

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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03/11/03

RF AMPLIFIER

MODEL *TM5147*

Available as: TM5147, 4 Pin TO-8 (T4)
 TN5147, 4 Pin Surface Mount (SM3)
 FP5147, 4 Pin Flatpack (FP4)
 BX5147, Connectorized Housing (H1)
 PN5147, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 3.25 dB Typical
- Wide Frequency Range
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 1100 MHz	20 - 1100 MHz
Gain (dB)	14	13.0 Min.
Power @ 1 dB Comp. (dBm)	+11	+9.0 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In Out	<1.6:1 <1.6:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	<3.5	4.0 Max.
Power Vdc mA	+15 27	+15 29 Max.

Note: Care should always be taken to effectively ground the case of each unit.

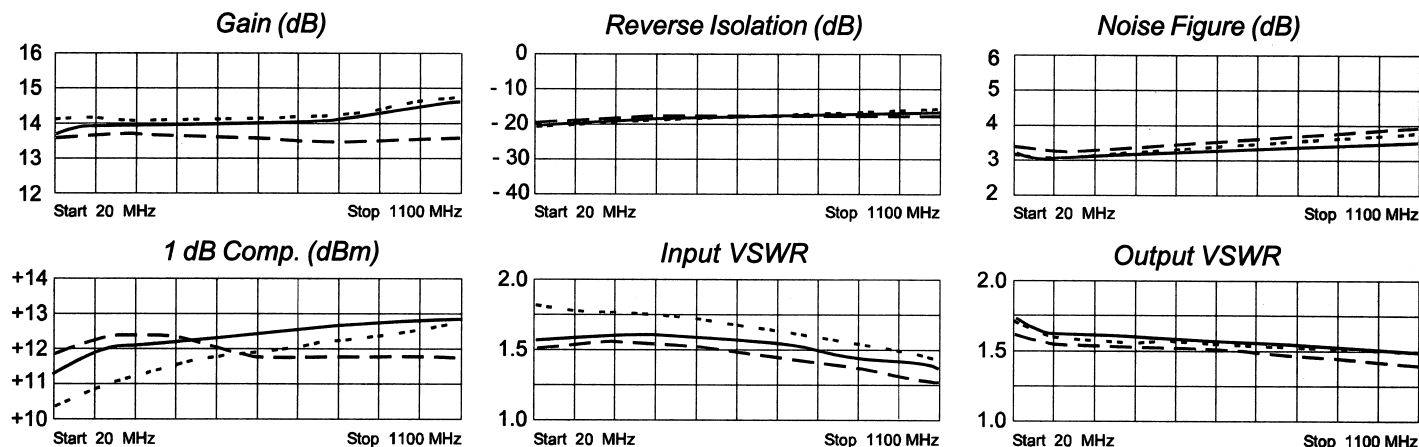
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend — + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-155	4.96	-173	.12	8	.25	164
50	.22	-179	5.08	176	.12	3	.22	164
100	.22	175	5.06	169	.12	2	.21	155
250	.21	158	5.06	150	.12	1	.22	128
500	.18	135	5.04	121	.14	- 0	.23	82
750	.13	117	5.12	91	.15	- 6	.24	42
1000	.08	121	5.21	59	.16	-14	.21	6
1250	.10	153	5.16	23	.17	-21	.17	- 26
1500	.16	146	4.70	- 17	.18	-29	.11	- 40

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2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 Rev.A 03/09/02

RF AMPLIFIER

MODEL *TM5149*

Available as: TM5149, 4 Pin TO-8 (T4)
 TN5149, 4 Pin Surface Mount (SM3)
 FP5149, 4 Pin Flatpack (FP4)
 BX5149, Connectorized Housing (H1)

Features

- High Gain: 23.5 dB Typical
- Low Noise Figure: <3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 150 MHz	5 - 150 MHz
Gain (dB)		23.5	22.5 Min.
Power @ 1 dB Comp. (dBm)		+18	+17.0 Min.
Reverse Isolation (dB)		- 29	- 28 Max.
VSWR	In	<1.5:1	2.0:1 Max.
	Out	<1.5:1	2.0:1 Max.
Noise figure (dB)		<3.0	3.2 Max.
Power	Vdc	+15	+15
	mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

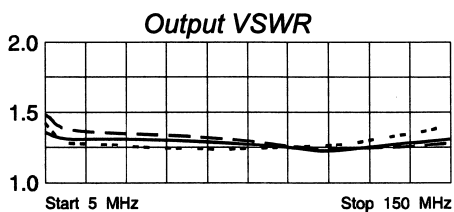
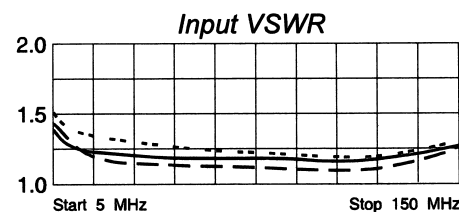
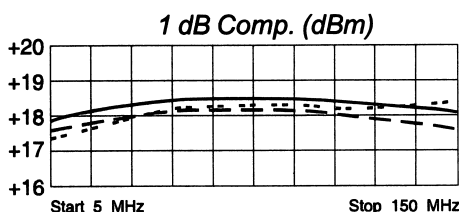
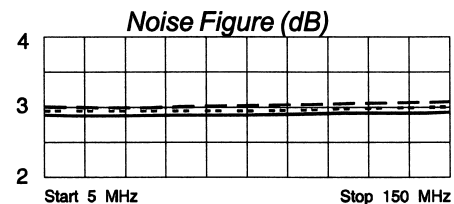
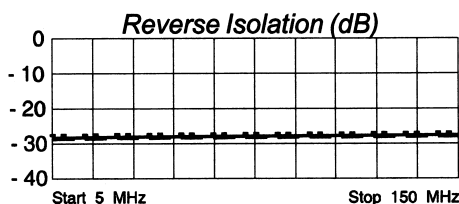
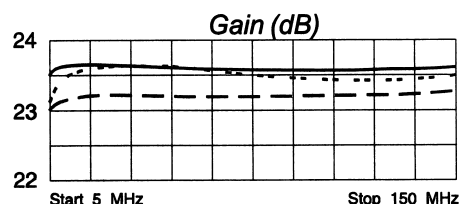
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +37 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	-121	14.72	-168	.04	6	.15	169
10	.12	-146	14.91	-178	.04	1	.13	170
50	.09	170	14.85	159	.03	- 8	.11	167
100	.05	142	14.90	136	.04	-16	.06	159
150	.01	2	15.00	113	.04	-28	.04	-111
200	.09	- 52	15.19	90	.04	-38	.12	- 93

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RF AMPLIFIER

MODEL *TM5150*

Available as: TM5150, 4 Pin TO-8 (T4)
 TN5150, 4 Pin Surface Mount (SM3)
 FP5150, 4 Pin Flatpack (FP4)
 BX5150, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- Medium Output Power: +18 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	20.0 ±.5	19.0 Min.
Power @ 1 dB Comp. (dBm)	+18	+17 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	1.75:1	2.5:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	47	53 Max.

Note: Care should always be taken to effectively ground the case of each unit.

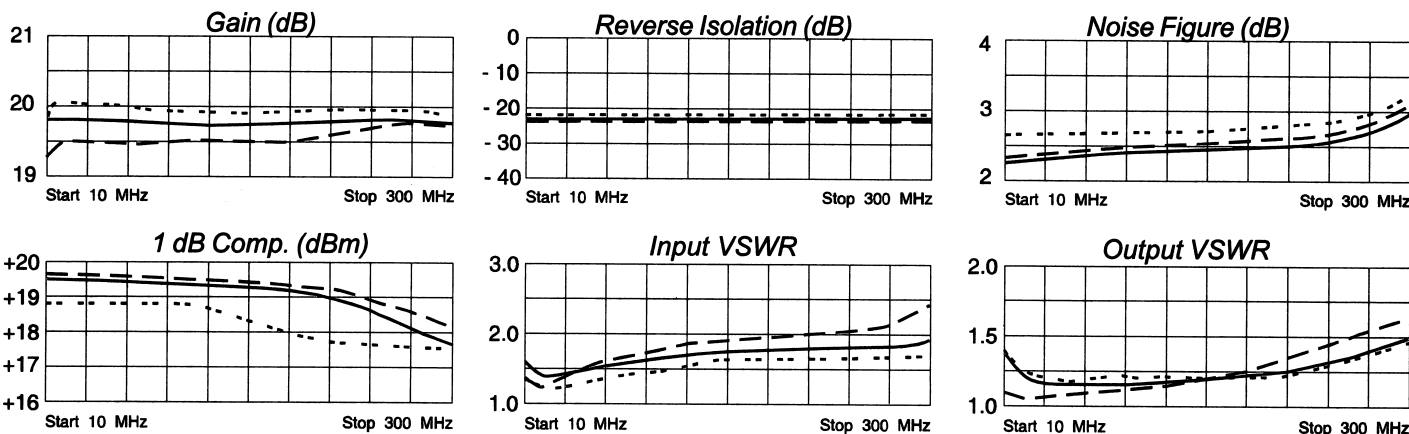
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.23	- 44	9.95	-173	.07	-172	.16	- 76
50	.19	- 57	10.0	159	.07	158	.07	- 87
100	.24	- 94	9.90	136	.07	133	.07	- 79
200	.29	-162	9.76	90	.07	86	.09	- 77
300	.30	121	9.91	38	.07	37	.21	-108

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RF AMPLIFIER

MODEL *TM5150PM*

Available as: TM5150PM, 4 Pin TO-8 (T4)
 TN5150PM, 4 Pin Surface Mount (SM3)
 FP5150PM, 4 Pin Flatpack (FP4)
 BX5150PM, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- Medium Output Power: +18 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	20.0±0.5	19.0 Min.
Power @ 1 dB Comp. (dBm)	+18	+17 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	1.75:1	2.5:1 Max.
VSWR Out	1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	47	53 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

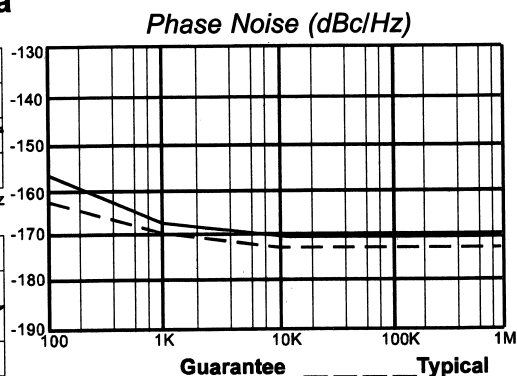
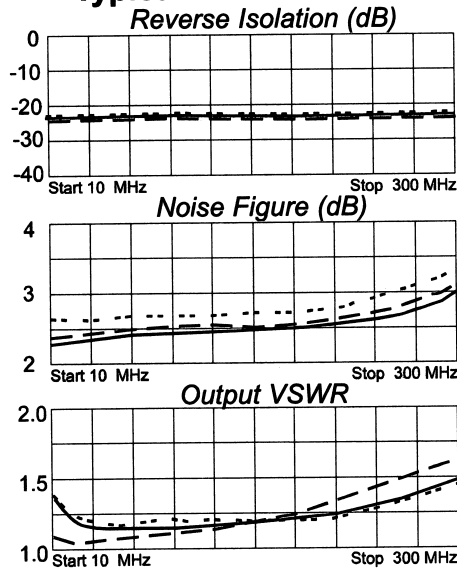
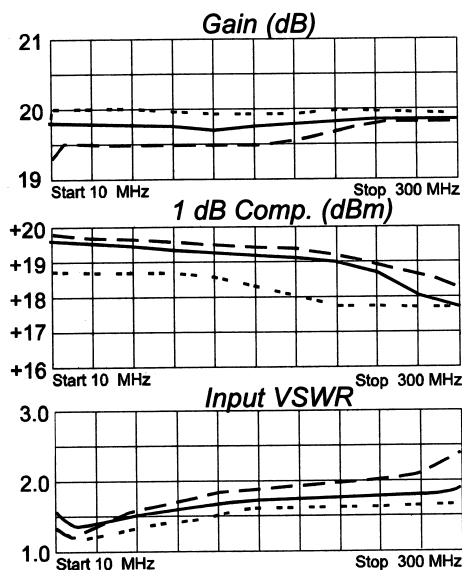
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee
100 Hz	- 162 (min.)	- 158
1 KHz	- 170	- 168
10 KHz	- 172	- 170
100 KHz	- 173	- 170
1 MHz	- 173	- 170

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

*Phase Noise Test Conditions:

- Carrier Frequency: 160 mHz
- Power Output: +18 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.23	-44	9.95	-173	.07	-172	.16	-76
50	.19	-57	10.0	159	.07	158	.07	-87
100	.24	-94	9.90	136	.07	133	.07	-79
200	.29	-162	9.76	90	.07	86	.09	-77
300	.30	121	9.91	38	.07	37	.21	-108

Amplifonix

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RF AMPLIFIER

MODEL *TM5152PM*

Available as: TM5152PM, 4 Pin TO-8 (T4)
 TN5152PM, 4 Pin Surface Mount (SM3)
 FP5152PM, 4 Pin Flatpack (FP4)
 BX5152PM, Connectorized Housing (H1)

Features

- High Gain: 17 dB Typical
- High Output Power: +20 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	17.0	16.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+17.5 Min.
Reverse Isolation (dB)	-20	-19 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	3.8 Max.
Power Vdc	+15	+15
mA	55	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point	+53 (Typ.)
Second Order Two Tone Intercept Point	+47 (Typ.)
Third Order Two Tone Intercept Point	+33 (Typ.)

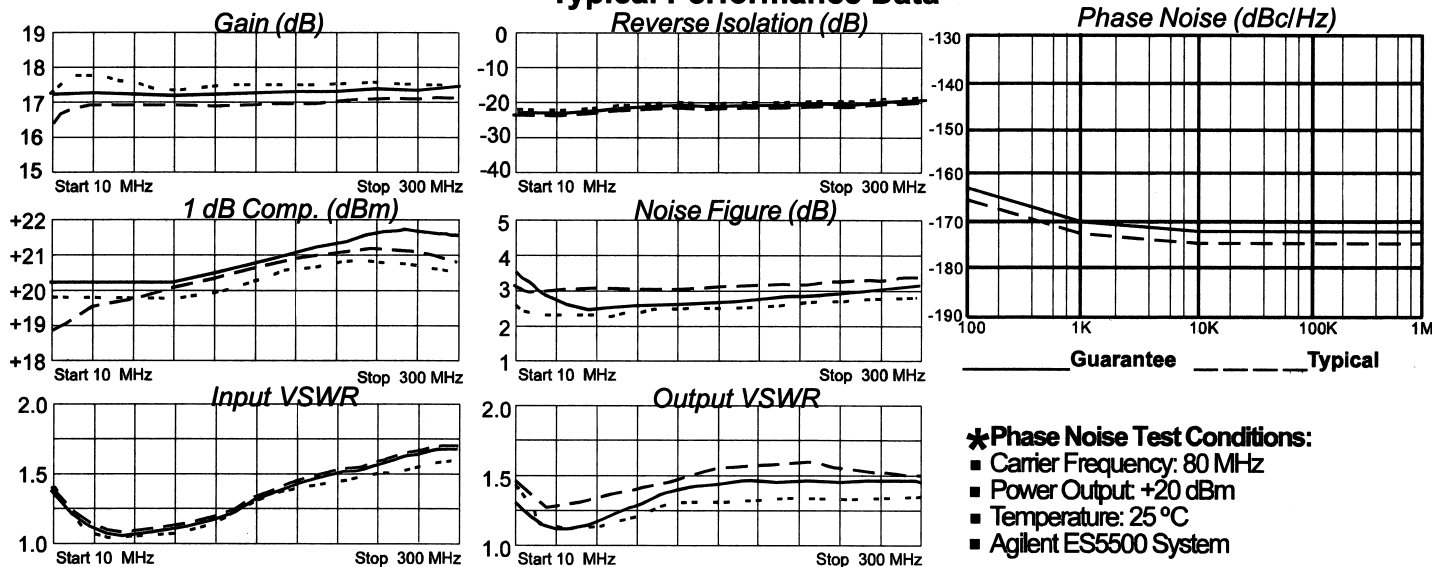
Maximum Ratings

Ambient Operating Temperature	-55°C to + 100 °C
Storage Temperature	-62°C to + 125 °C
Case Temperature	+ 125 °C
DC Voltage	+ 18 Volts
Continuous RF Input Power	+ 13 dBm
Short Term RF Input Power	50 mW (1 Minute Max.)
Maximum Peak Power	0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-166	-164
1 KHz	-172	-170
10 KHz	-174	-172
100 KHz	-174	-172
1 MHz	-174	-172

Typical Performance Data



*Phase Noise Test Conditions:

- Carrier Frequency: 80 MHz
- Power Output: +20 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	-76	6.84	-156	.09	-155	.15	-33
50	.04	-87	7.19	166	.09	163	.08	20
100	.07	-94	7.15	148	.09	145	.12	23
200	.15	-123	7.16	114	.10	108	.18	3
300	.24	-159	7.21	80	.11	75	.18	-30
400	.29	155	7.38	43	.11	41	.16	-82
500	.29	89	7.30	1	.11	5	.19	-161

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/11/03

RF AMPLIFIER

MODEL *TM5155*

Available as: TM5155, 4 Pin TO-8 (T4)
 TN5155, 4 Pin Surface Mount (SM3)
 FP5155, 4 Pin Flatpack (FP4)
 BX5155, Connectorized Housing (H1)

Features

- High 3rd Order Intercept: +37 dBm Typical
- Medium Gain: 15 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	15.0	15.0 ± 1.0 Min.
Power @ 1 dB Comp. (dBm)	>+22	+21 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<5	6.0 Max.
Power Vdc	+15	+15
mA	85	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

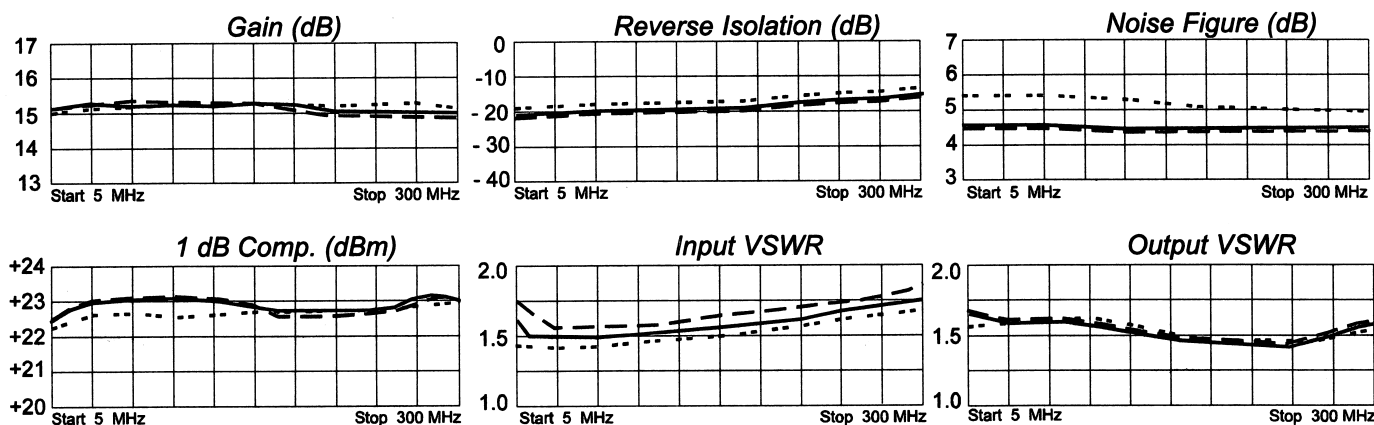
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +37 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.24	-30	5.73	-166	.090	15	.25	53
10	.20	-20	5.86	-175	.082	8	.23	25
50	.19	-19	5.86	168	.084	5	.22	-15
100	.19	-33	5.90	152	.101	4	.19	-41
150	.20	-50	5.88	137	.109	5	.18	-68
200	.21	-71	5.87	122	.120	3	.15	-105
300	.24	-111	5.59	91	.143	-5	.18	-163

Amplifonix

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RF AMPLIFIER

MODEL *TM5155PM*

Available as: TM5155PM, 4 Pin TO-8 (T4)
 TN5155PM, 4 Pin Surface Mount (SM3)
 FP5155PM, 4 Pin Flatpack (FP4)
 BX5155PM, Connectorized Housing (H1)

Features

- High 3rd Order Intercept: +37 dBm Typical
- Medium Gain: 15 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	15.0	15.0 ± 1.0 Min.
Power @ 1 dB Comp. (dBm)	>+22	+21 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<5	6.0 Max.
Power Vdc	+15	+15
mA	85	90 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +37 (Typ.)

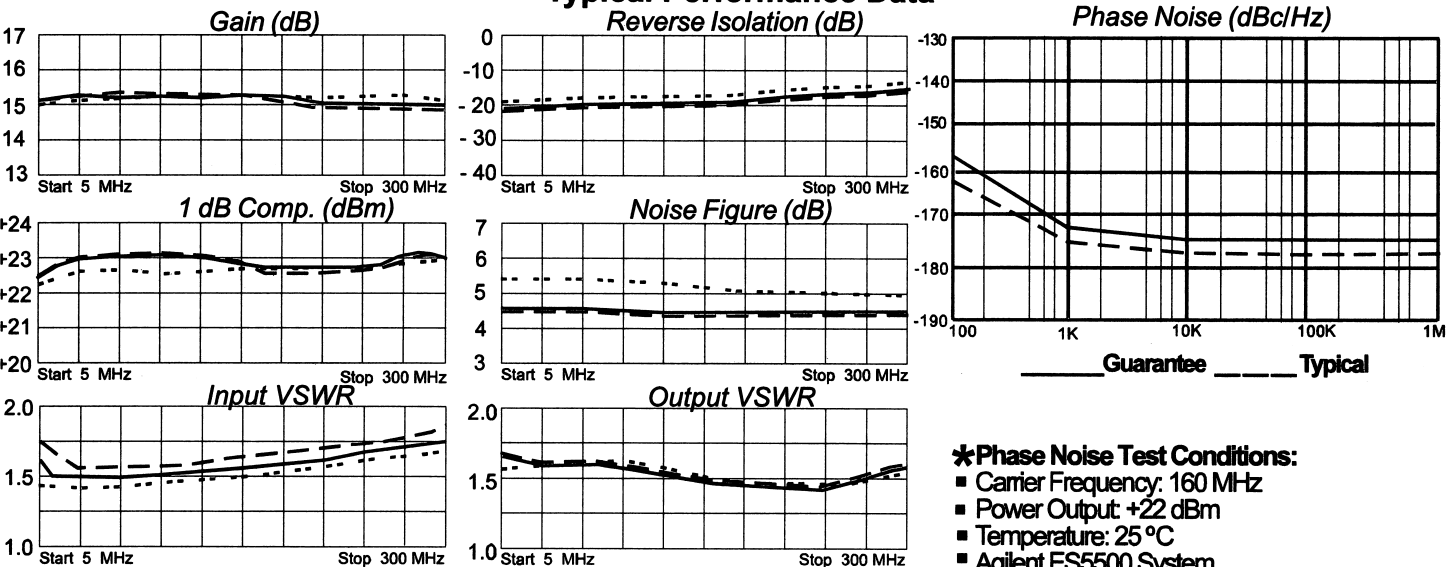
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	- 162	- 158
1 KHz	- 175	- 172
10 KHz	- 178	- 175
100 KHz	- 178	- 175
1 MHz	- 178	- 175

Typical Performance Data



*Phase Noise Test Conditions:

- Carrier Frequency: 160 MHz
- Power Output: +22 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	---S11---	---S21---	---S12---	---S22---
	Mag Deg	Mag Deg	Mag Deg	Mag Deg
5	.24 -30	5.73 -166	.090 15	.25 53
10	.20 -20	5.86 -175	.082 8	.23 25
50	.19 -19	5.86 168	.094 5	.22 -15
100	.19 -33	5.90 162	.101 4	.19 -41
150	.20 -50	5.88 137	.109 5	.18 -68
200	.21 -71	5.87 122	.120 3	.15 -105
300	.24 -111	5.59 91	.143 -5	.18 163

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03/11/03

RF AMPLIFIER

MODEL TM5171

Available as: TM5171, 4 Pin TO-8 (T4)
 TN5171, 4 Pin Surface Mount (SM3)
 FP5171, 4 Pin Flatpack (FP4)
 BX5171, Connectorized Housing (H1)
 PN5171, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +26 dBm Typ.
- High Dynamic Range: $I_p^3 = +39$ dBm Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 150 MHz	20 - 150 MHz
Gain (dB)	13.5	13 Min./14 Max.
Power @ 1 dB Comp. (dBm)	+27	+26 Min.
Reverse Isolation (dB)	- 25	Max.
VSWR In	1.5:1	1.6:1 Max.
VSWR Out	1.5:1	1.6:1 Max.
Noise figure (dB)	6.5	7 Max.
Power Vdc	+15	+15
mA	105	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

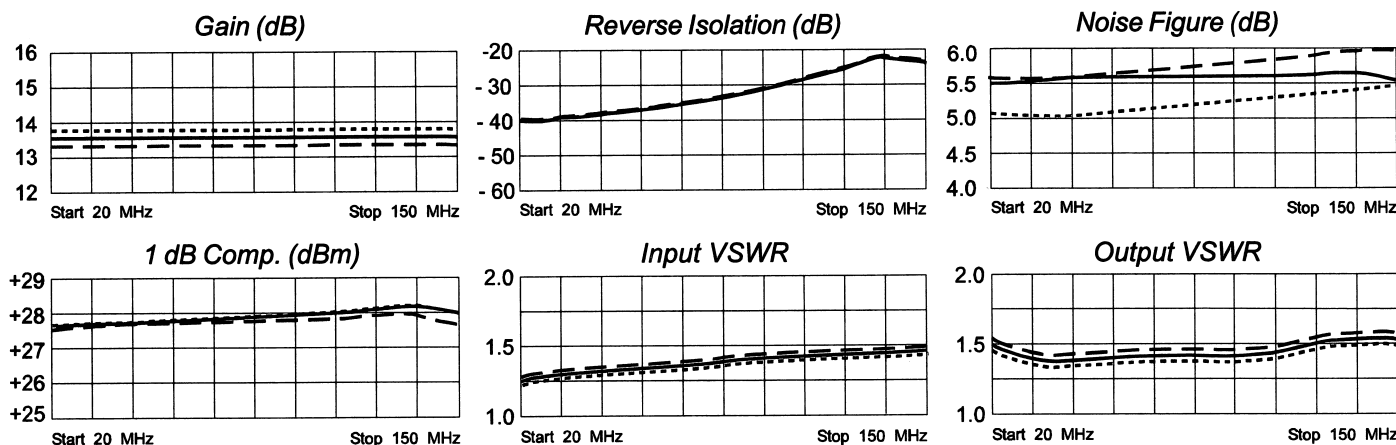
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

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6/07/02

RF AMPLIFIER

MODEL *TM5175*

Available as: TM5175, 4 Pin TO-8 (T4)
TN5175, 4 Pin Surface Mount (SM3)
FP5175, 4 Pin Flatpack (FP4)
BX5175, Connectorized Housing (H1)
PN5175, Reduced Size Surface Mount (SM11)

Features

- High Gain: 16.3 dB Typical
- High Output Power: > +18 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 500 MHz	20 - 500 MHz
Gain (dB)	16.3	16.3 ± 0.8
Power @ 1 dB Comp. (dBm)	+18	+16.5 Min.
Reverse Isolation (dB)	- 20	-18.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	3.8 Max.
Power Vdc	+15	+15
mA	45	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

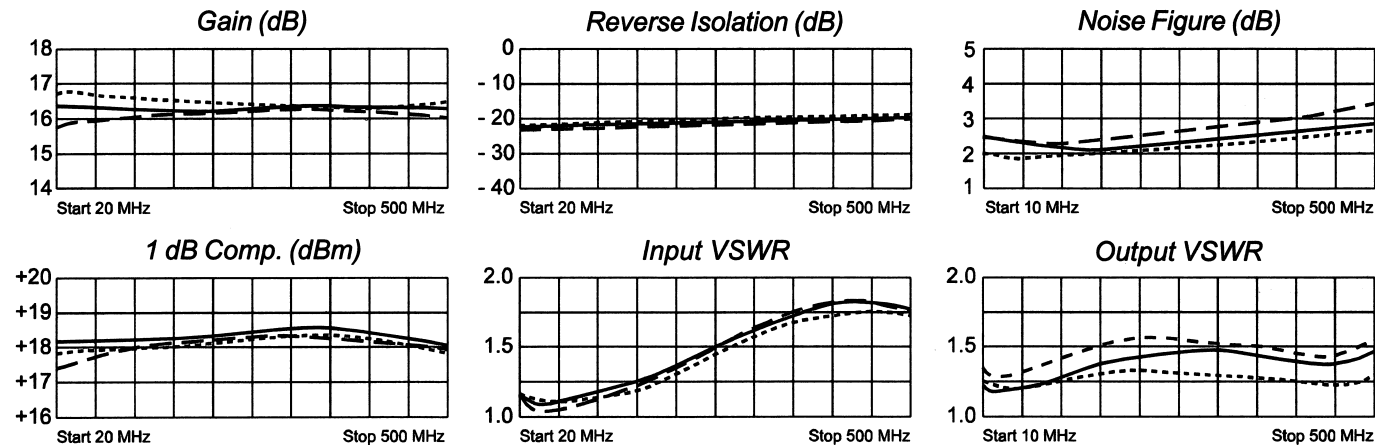
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +47 (Typ.)
Second Order Two Tone Intercept Point +41 (Typ.)
Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.2 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
5	.16	- 76	6.49	-156	.09	-155	.15	- 33
50	.04	- 87	6.48	166	.09	163	.08	20
100	.07	- 94	6.44	148	.09	145	.12	23
200	.15	-123	6.46	114	.10	108	.18	3
300	.24	-159	6.50	80	.11	75	.18	- 30
400	.29	155	6.65	41	.11	41	.16	- 82
500	.29	89	6.58	1	.11	5	.19	-161

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RF AMPLIFIER

MODEL *TM5198*

Available as: TM5198, 4 Pin TO-8 (T4)
 TN5198, 4 Pin Surface Mount (SM3)
 FP5198, 4 Pin Flatpack (FP4)
 BX5198, Connectorized Housing (H1)

Features

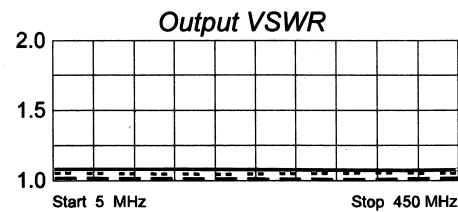
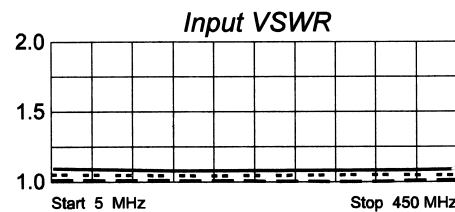
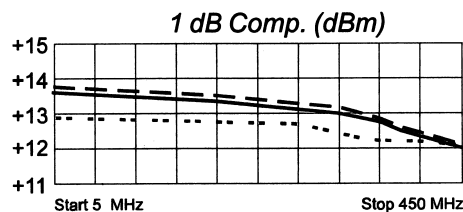
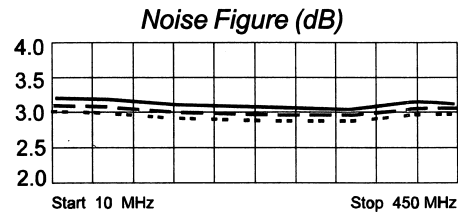
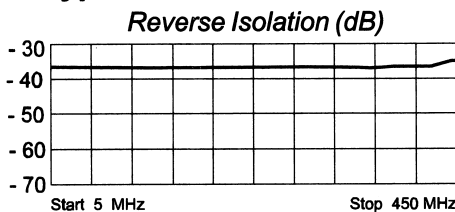
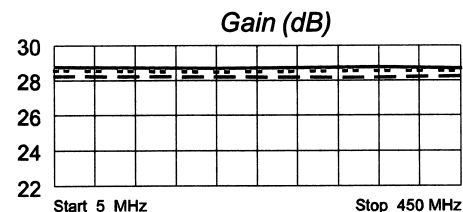
- Low Noise Figure: 3.0 dB Typical
- Excellent Reverse Isolation
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 450 MHz	5 - 450 MHz
Gain (dB)	28.0	27 Min/29Max.
Gain Flatness (dB-Max)	+/- 0.5	+/- 0.8
Power @ 1 dB Comp. (dBm)	+12	+11.5 Min.
Reverse Isolation (dB)	-20	-19 Min.
VSWR In	1.3:1	1.5:1 Max.
Out	1.3:1	1.5:1 Max.
Noise figure (dB)	3.0	3.9 Max.
Power Vdc	+5	+5
mA	50	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - - -55 °C

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 125 °C
 Storage Temperature -65°C to + 150 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Amplifonix

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RF AMPLIFIER

MODEL *TM5304*

Available as: TM5304, 4 Pin TO-8 (T4)
 TN5304, 4 Pin Surface Mount (SM3)
 FP5304, 4 Pin Flatpack (FP4)
 BX5304, Connectorized Housing (H1)

Features

- High Gain: 19.5 dB Typical
- Low Noise Figure: <2.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 200 MHz	5 - 200 MHz
Gain (dB)	19.5	18.5 Min.
Power @ 1 dB Comp. (dBm)	+10.5	+9.5 Min.
Reverse Isolation (dB)	- 26	- 25 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+15	+15
mA	24	25 Max.

Note: Care should always be taken to effectively ground the case of each unit.

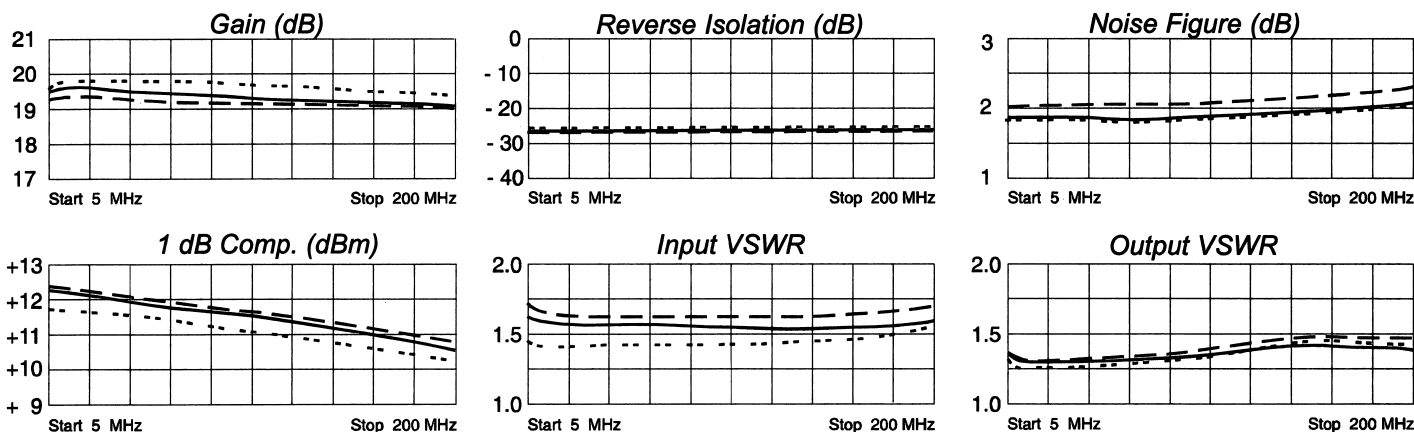
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.24	- 18	9.29	-173	.05	-172	.15	- 29
10	.23	- 14	9.37	180	.05	-179	.13	- 18
50	.22	- 32	9.27	160	.05	157	.13	- 19
100	.21	- 65	9.20	138	.05	137	.15	- 37
150	.21	-104	9.09	117	.05	111	.17	- 60
200	.24	-145	8.85	94	.05	89	.16	- 82
300	.37	150	7.82	45	.05	46	.07	-106

Amplifonix

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RF AMPLIFIER

MODEL *TM5325*

Available as: TM5325, 4 Pin TO-8 (T4)
 TN5325, 4 Pin Surface Mount (SM3)
 FP5325, 4 Pin Flatpack (FP4)
 BX5325, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.0 dB Typical
- High Output Power: +24 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	20.5	20.5 ± 1.0
Power @ 1 dB Comp. (dBm)	+24	+22.5 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	1.70:1	2.2:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+12	+12
mA	85	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

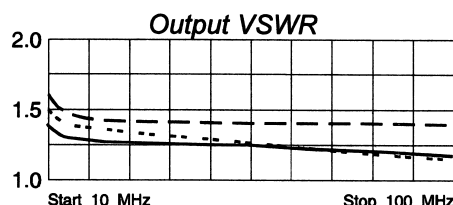
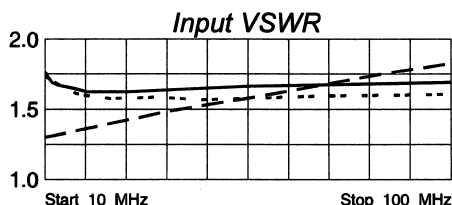
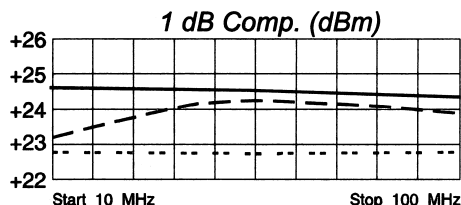
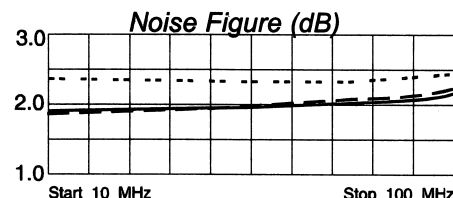
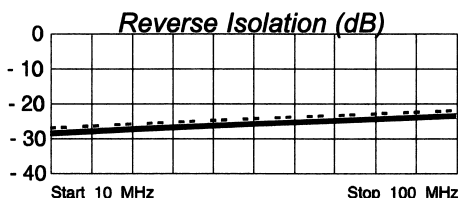
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.35	- 32	10.28	-157	.05	-159	.27	- 27
10	.27	- 28	10.95	-171	.05	-174	.16	- 32
50	.23	- 36	11.12	161	.06	151	.11	- 3
100	.26	- 68	11.10	139	.06	127	.10	- 10
150	.32	-106	10.87	115	.07	103	.06	- 29

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3/13/03

RF AMPLIFIER

MODEL *TM5338*

Available as: TM5338, 4 Pin TO-8 (T4)
 TN5338, 4 Pin Surface Mount (SM3)
 FP5338, 4 Pin Flatpack (FP4)
 BX5338, Connectorized Housing (H1)

Features

- High Output Power: +25 dBm Typical
- Low Noise Figure: 2.7 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 150 MHz	5 - 150 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+25	+23.0 Min.
Reverse Isolation (dB)	- 20	- 19 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.7	3.5 Max.
Power Vdc	+12	+12
mA	88	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

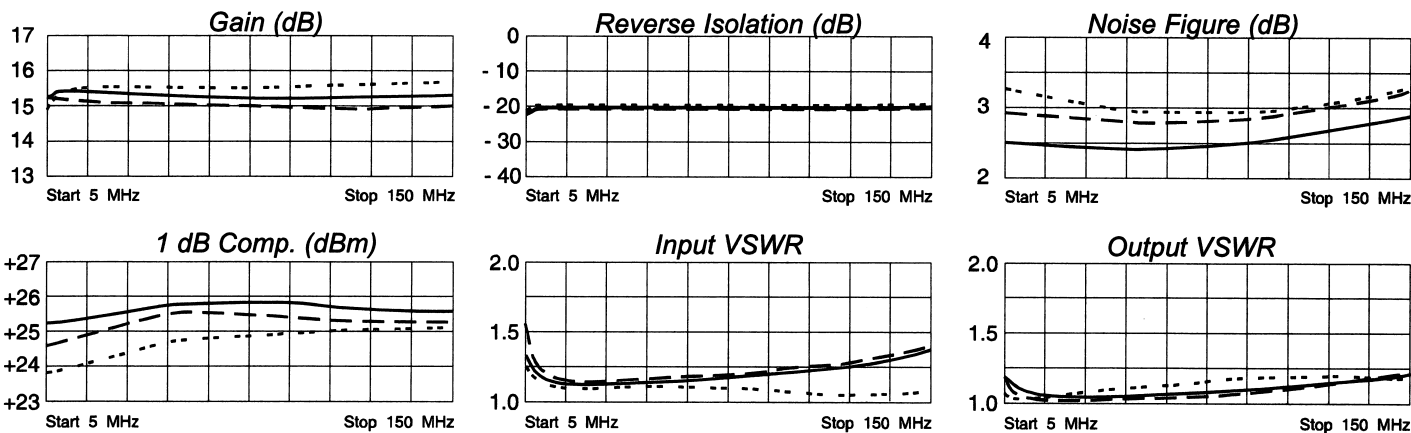
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	-96	5.81	-164	.09	-171	.09	-42
25	.06	-140	5.85	169	.10	167	.02	-90
50	.07	-153	5.83	154	.10	151	.02	-105
75	.07	-155	5.78	139	.10	135	.02	-116
100	.09	-162	5.78	125	.10	120	.04	-152
125	.12	-164	5.80	110	.10	105	.06	179
150	.17	-169	5.80	94	.10	89	.09	149

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RF AMPLIFIER

MODEL *TM5352*

Available as: TN5352, 4 Pin Surface Mount (SM3)
BX5352, Connectorized Housing (HI)

Features

- High Gain: 17 dB Typical
- High Output Power: +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300	10 - 300
Gain (dB)	17	16.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+17.5 Min.
Reverse Isolation (dB)	- 20	- 19 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	3.8 Max.
Power Vdc	+12	+12
mA	55	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

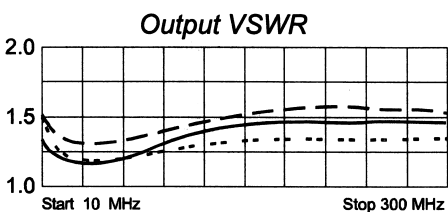
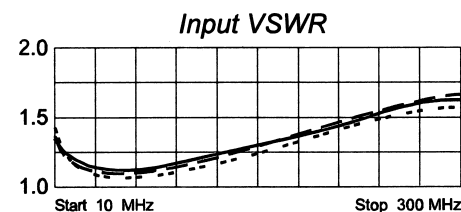
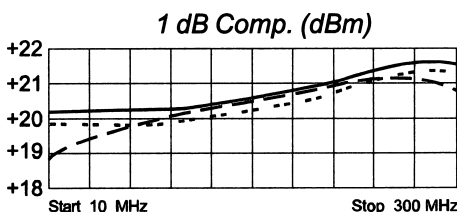
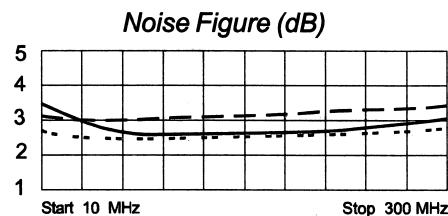
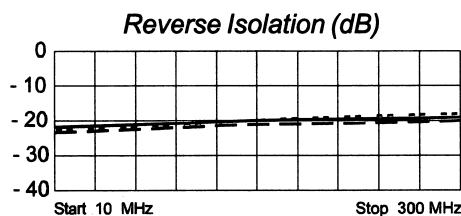
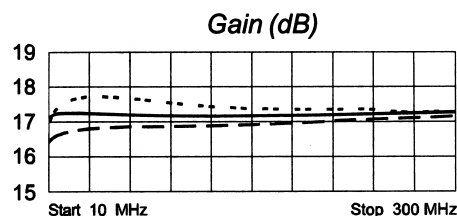
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
Second Order Two Tone Intercept Point +47 (Typ.)
Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13dBm
Short Term RF Input Power 50 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.2 Watt
(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	- 76	6.84	-156	.09	-155	.15	- 33
50	.04	- 87	7.19	166	.09	163	.08	20
100	.07	- 94	7.15	148	.09	145	.12	23
200	.15	-123	7.16	114	.10	108	.18	3
300	.24	-159	7.21	80	.11	75	.18	- 30
400	.29	155	7.38	43	.11	41	.16	- 82
500	.29	89	7.30	1	.11	5	.19	-161

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RF AMPLIFIER

MODEL *TM5441*

Available as: TM5441, 4 Pin TO-8 (T4)
 TN5441, 4 Pin Surface Mount (SM3)
 FP5441, 4 Pin Flatpack (FP4)
 BX5441, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Medium Power: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	14.5	13.0 Min.
Power @ 1 dB Comp. (dBm)	+15	+12.0 Min.
Reverse Isolation (dB)	- 20	- 17 Max.
VSWR In	1.25:1	2.0:1 Max.
Out	1.6:1	2.0:1 Max.
Noise figure (dB)	3.8	4.5 Max.
Power Vdc	+5	+5
mA	33	36 Max.

Note: Care should always be taken to effectively ground the case of each unit.

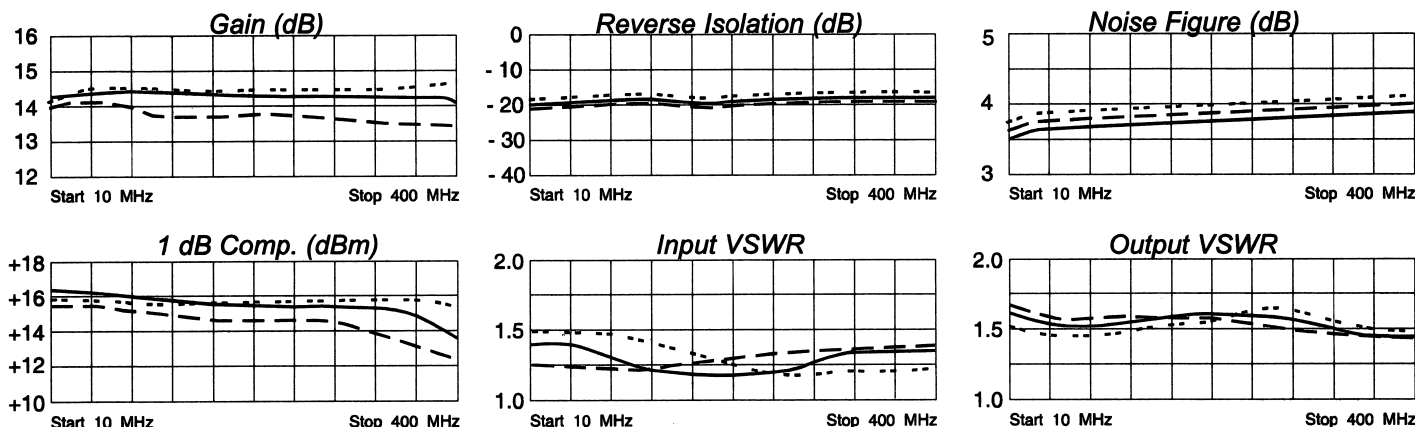
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.15	-147	5.21	-176	.10	6	.24	169
50	.13	-177	6.29	162	.10	- 7	.22	180
100	.12	178	5.22	142	.10	- 15	.22	-178
200	.09	-165	5.10	103	.10	- 33	.24	179
300	.12	-149	5.10	62	.11	- 54	.22	158
400	.14	166	5.01	13	.12	- 82	.18	80
500	.22	31	4.06	- 47	.11	-128	.49	- 23

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RF AMPLIFIER

MODEL *TM5519*

Available as: TM5519, 4 Pin TO-8 (T4)
 TN5519, 4 Pin Surface Mount (SM3)
 FP5519, 4 Pin Flatpack (FP4)
 BX5519, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Low Noise Figure: 2.25 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+14.5	+11.5 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.9:1	2.2:1 Max.
Noise figure (dB)	2.25	3.0 Max.
Power Vdc	+5	+5
mA	30	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

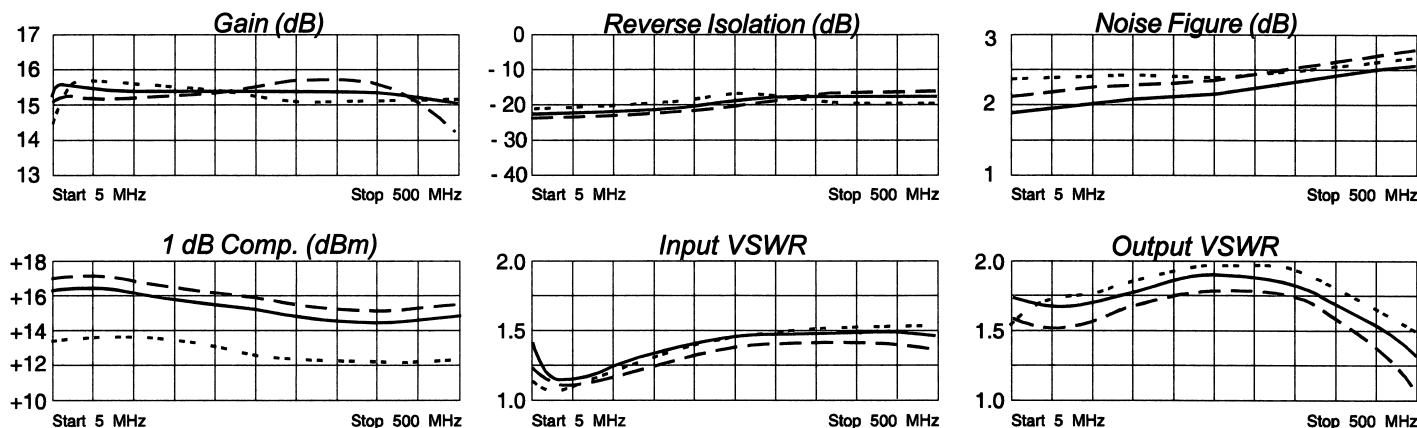
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +39 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.15	-57	5.84	-165	.09	-165	.28	-16
50	.08	-76	6.01	166	.09	161	.25	-30
100	.12	-105	5.92	150	.09	140	.26	-53
200	.18	-147	5.78	119	.10	105	.31	-92
300	.21	175	5.71	90	.11	76	.32	-122
400	.20	137	5.73	57	.12	49	.28	-146
500	.20	103	5.58	19	.13	24	.16	-163

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RF AMPLIFIER

MODEL *TM5544*

Available as: TM5544, 4 Pin TO-8 (T4)
 TN5544, 4 Pin Surface Mount (SM3)
 FP5544, 4 Pin Flatpack (FP4)
 BX5544, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Low Noise Figure: 2.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	12.5	11.0 Min.
Power @ 1 dB Comp. (dBm)	+14.5	+11.5 Min.
Reverse Isolation (dB)	- 15.5	- 14.5 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+5	+5
mA	35	42 Max.

Note: Care should always be taken to effectively ground the case of each unit.

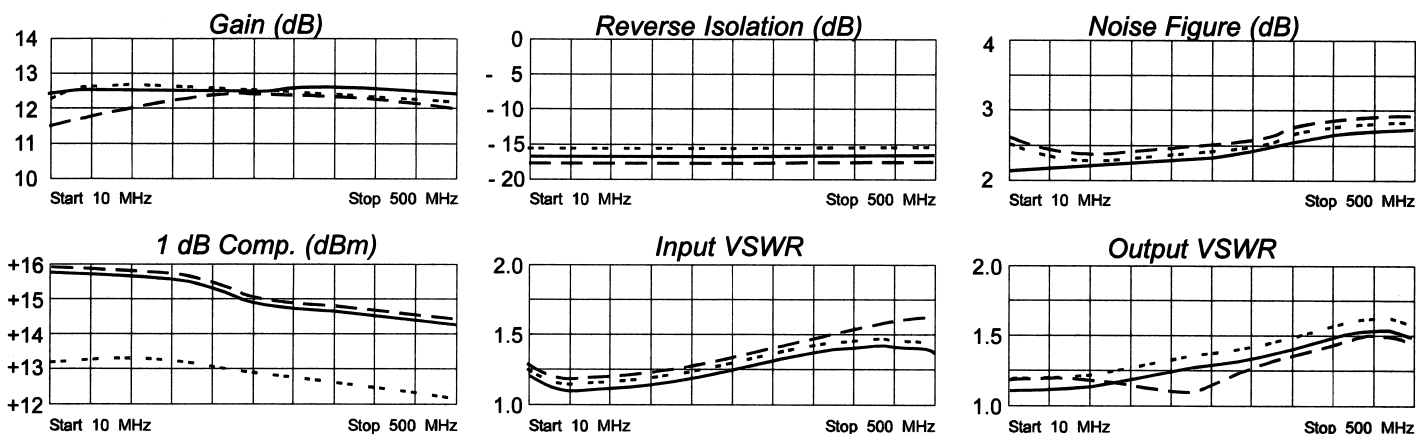
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.04	-127	4.11	-172	.17	-171	.03	-119
50	.04	-154	4.15	171	.17	170	.01	-174
100	.05	-167	4.16	159	.17	158	.00	56
200	.08	169	4.21	135	.17	135	.07	-35
300	.11	152	4.23	112	.17	113	.14	-65
400	.14	135	4.25	86	.17	92	.20	-85
500	.15	131	4.15	59	.17	69	.22	-104

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RF AMPLIFIER

MODEL *TM5670*

Available as: TM5670, 4 Pin TO-8 (T4)
 TN5670, 4 Pin Surface Mount (SM3)
 FP5670, 4 Pin Flatpack (FP4)
 BX5670, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.0 dB Typical
- 5 Volt Operation
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 250 MHz	20 - 250 MHz
Gain (dB)	8.2	7.0 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+13.5 Min.
Reverse Isolation (dB)	- 11	- 10 Max.
VSWR In	1.35:1	2.0:1 Max.
Out	1.20:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+5	+5
mA	25	30 Max.

Note: Care should always be taken to effectively ground the case of each unit.

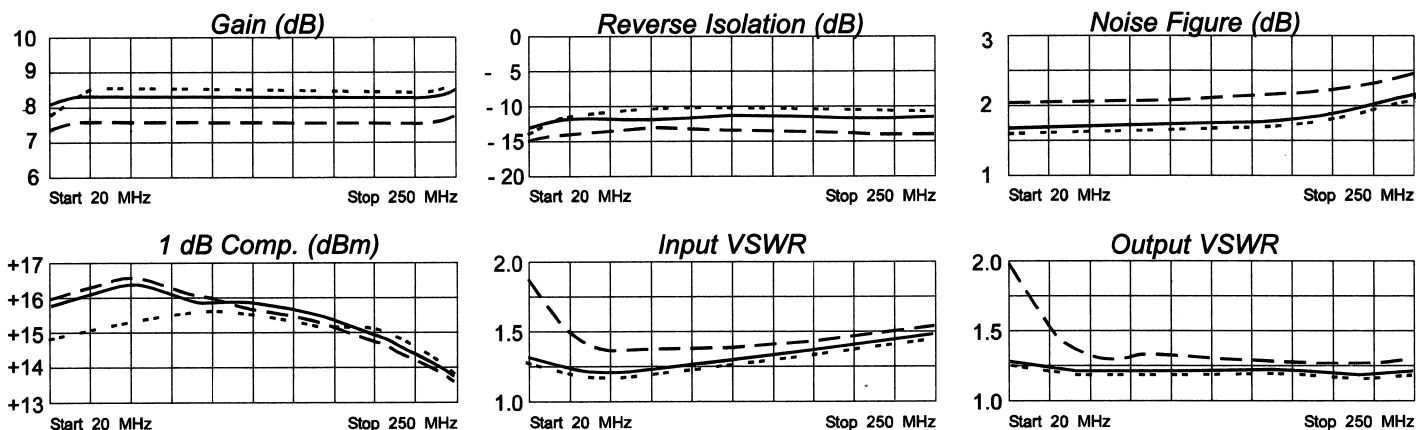
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.14	153	2.50	7	.28	7	.13	150
50	.11	-180	2.54	-9	.28	-9	.09	165
100	.12	-174	2.54	-21	.28	-20	.09	165
150	.14	-169	2.54	-32	.27	-31	.10	167
200	.18	-171	2.56	-44	.27	-43	.11	168
250	.23	-173	2.58	-56	.26	-55	.14	166

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RF AMPLIFIER

MODEL *TM5817*

Available as: TM5817, 4 Pin TO-8 (T4)
TN5817, 4 Pin Surface Mount (SM3)
FP5817, 4 Pin Flatpack (FP4)
BX5817, Connectorized Housing (H1)
PN5817, Reduced Size Surface Mount (SM11)

- ### Features

 - High Output Power: >+22 dBm Typical
 - High Third Order Intercept: +32 dBm Typical
 - Operating Temp. - 55 °C to +85 °C
 - Environmental Screening Available
- ### Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
Second Order Two Tone Intercept Point +44 (Typ.)
Third Order Two Tone Intercept Point +32 (Typ.)

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	14	14 ± 1
Power @ 1 dB Comp. (dBm)	>+23	+20.0 Min.
Reverse Isolation (dB)	- 20	-18.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<6.0*	7.0* Max.
Power Vdc	+15	+15
mA	98	102 Max.

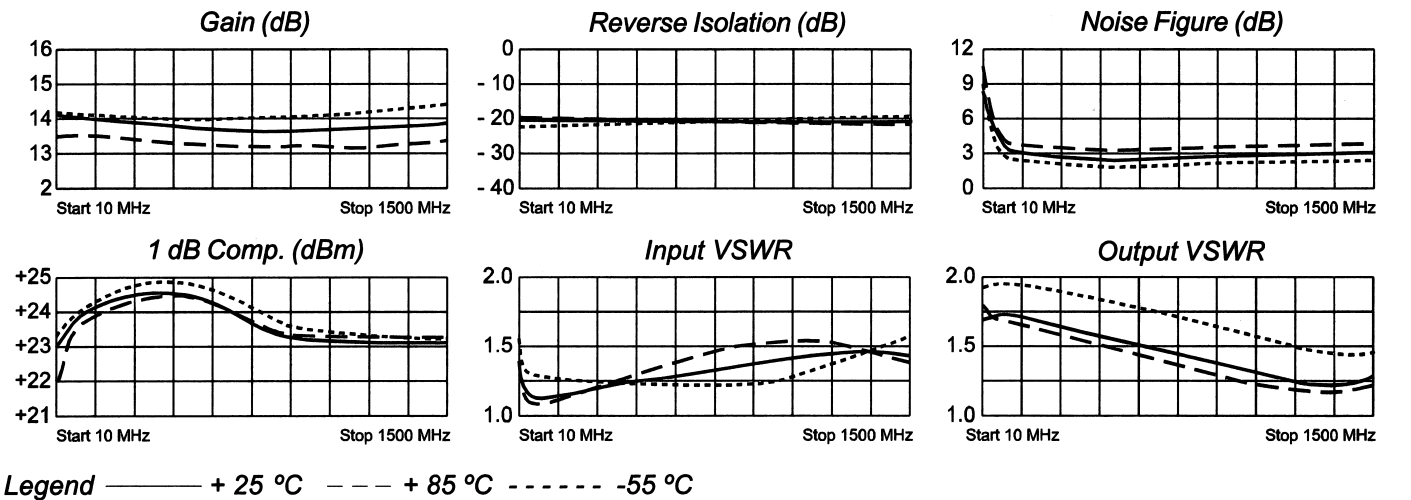
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 17 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

* Noise figure is greater than 7.0 dB for frequencies below 30 MHz.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Linear S-Parameters

FREQ. MHz	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.18	-114	5.26	-167	.102	7	.26	171
100	.07	-165	5.08	171	.099	- 4	.27	173
300	.08	-132	4.97	152	.099	- 12	.26	159
500	.12	-127	4.89	134	.099	- 22	.23	145
700	.16	-124	4.83	117	.098	- 32	.19	131
900	.18	-130	4.82	98	.098	- 42	.16	115
1100	.21	-130	4.86	79	.097	- 54	.11	96
1300	.20	-131	4.92	59	.097	- 67	.11	73
1500	.21	-131	4.97	35	.096	- 83	.13	40



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RF AMPLIFIER

MODEL *TM5834*

Available as: TM5834, 4 Pin TO-8 (T4)
 TN5834, 4 Pin Surface Mount (SM3)
 FP5834, 4 Pin Flatpack (FP4)
 BX5834, Connectorized Housing (H1)

Features

- High Output Power: +27.5 dBm Typical
- High IP₃: +40 dBm
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 100 MHz	10 - 100 MHz
Gain (dB)	19.7±0.5	18.7 Min./20.7 Max.
Power @ 1 dB Comp. (dBm)	+27.5	+26 Min.
Reverse Isolation (dB)	-25	-24 Max.
VSWR In	1.7:1	2.0:1 Max.
Out	1.3:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+15	+15
mA	135	145 Max.

Note: Care should always be taken to effectively ground the case of each unit.

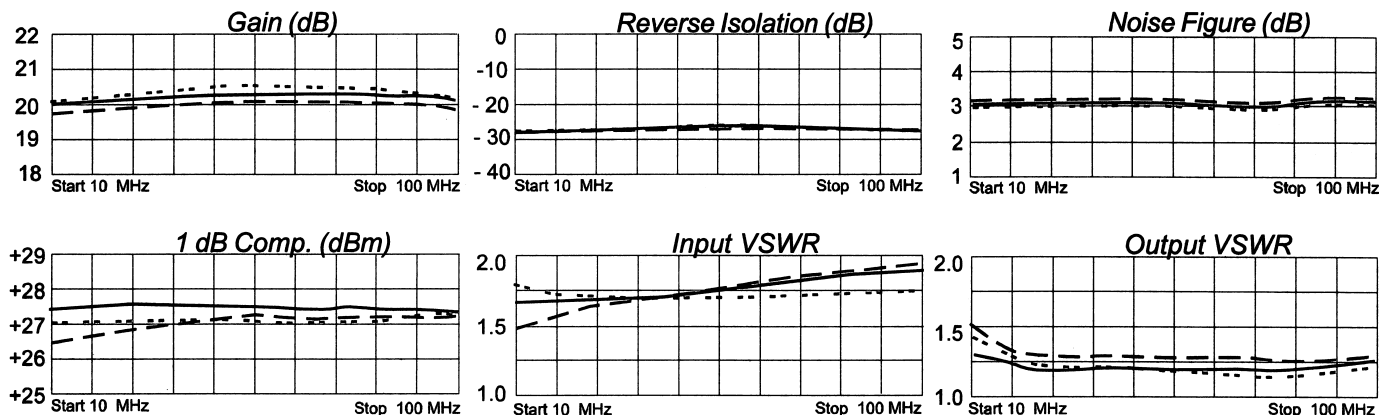
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-54	8.79	-127	.04	-124	.34	72
10	.16	-29	9.89	-157	.05	-157	.14	40
20	.16	-27	10.12	-175	.05	-178	.09	26
50	.19	-50	10.11	164	.05	160	.09	18
75	.21	-72	10.00	151	.05	145	.09	12
100	.24	-91	9.84	139	.05	132	.09	5
150	.32	-126	9.26	116	.06	108	.06	-6

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RF AMPLIFIER

MODEL *TM5834PM*

Available as: TM5834PM, 4 Pin TO-8 (T4)
 TN5834PM, 4 Pin Surface Mount (SM3)
 BX5834PM, Connectorized Housing (H1)

Features

- Superior Phase Noise Performance
- High Gain: 19.7±0.5 dB
- Low Noise: <3.5 dB Typ., High Power: +27.5 dBm Typ.
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 100 MHz	10 - 100 MHz
Gain (dB)	19.7±0.5	18.7 Min./20.7 Max.
Power @ 1 dB Comp. (dBm)	+27.5	+26 Min.
Reverse Isolation (dB)	-25	-24 Max.
VSWR In	1.7:1	2.0:1 Max.
Out	1.3:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+15	+15
mA	135	145 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

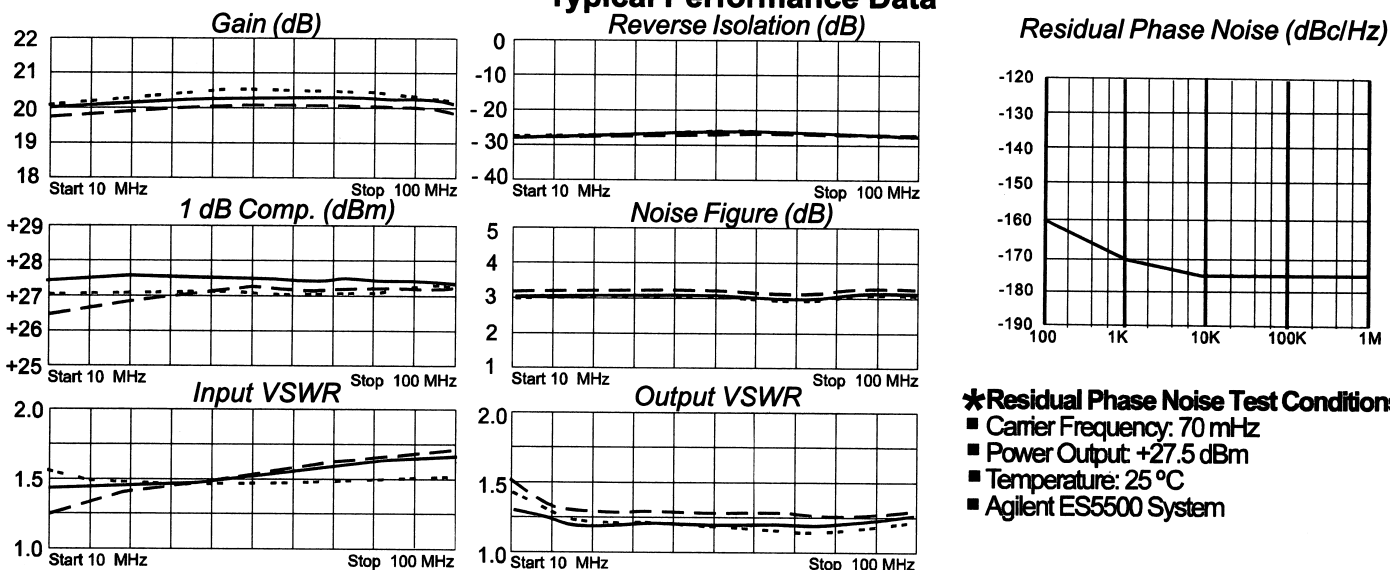
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	162	158
1 KHz	172	168
10 KHz	176	172
100 KHz	176	172
1 MHz	176	172

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-54	8.79	-127	.04	-124	.34	72
10	.16	-29	9.89	-157	.05	-157	.14	40
20	.16	-27	10.12	-175	.05	-178	.09	26
50	.19	-50	10.11	164	.05	160	.09	18
75	.21	-72	10.00	151	.05	145	.09	12
100	.24	-91	9.84	139	.05	132	.09	5
150	.32	-126	9.26	116	.06	108	.06	-6

*Residual Phase Noise Test Conditions:

- Carrier Frequency: 70 mHz
- Power Output: +27.5 dBm
- Temperature: 25 °C
- Agilent ES5500 System

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02/14/03

RF AMPLIFIER

MODEL *TM6112*

Available as: TM6112, 4 Pin TO-8 (T4)
 TN6112, 4 Pin Surface Mount (SM3)
 FP6112, 4 Pin Flatpack (FP4)
 BX6112, Connectorized Housing (H1)

Features

- Low Noise Figure: 2 dB Typical
- Medium Output Power: +14 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 200 MHz	10 - 200 MHz
Gain (dB)	16.4	15.5 Min.
Power @ 1 dB Comp. (dBm)	+14.5	+12.0 Min.
Reverse Isolation (dB)	- 20	- 19 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	27	30 Max.

Note: Care should always be taken to effectively ground the case of each unit.

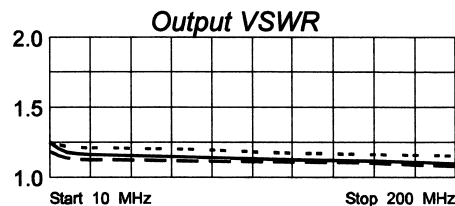
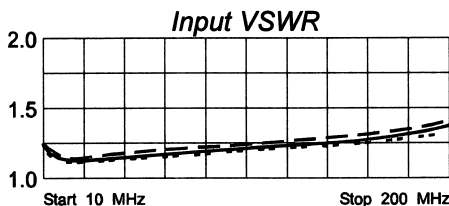
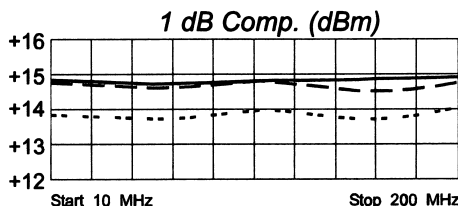
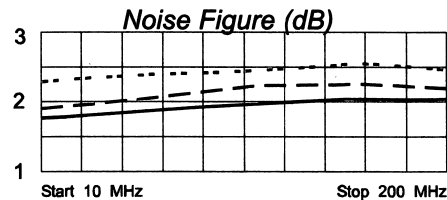
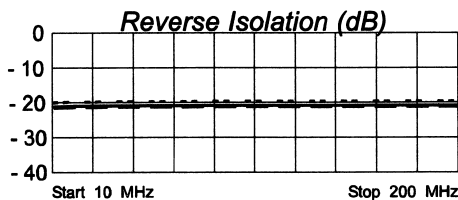
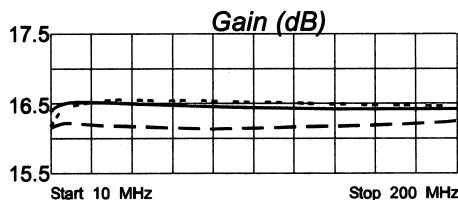
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	- 74	6.66	-172	.09	-172	.13	- 42
50	.06	- 84	6.67	168	.09	167	.08	- 23
100	.09	- 99	6.65	154	.09	151	.07	- 29
150	.12	-113	6.62	140	.09	136	.06	- 40
200	.18	-125	6.63	125	.10	123	.05	- 72
250	.25	-139	6.59	110	.10	108	.04	-122

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RF AMPLIFIER

MODEL *TM6117*

Available as: TM6117, 4 Pin TO-8 (T4)
 TN6117, 4 Pin Surface Mount (SM3)
 FP6117, 4 Pin Flatpack (FP4)
 BX6117, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.3 dB Typical
- Medium Third Order Intercept: +28 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	8.2	7.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+9.0 Min.
Reverse Isolation (dB)	- 11	- 10 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	<1.3	2.0 Max.
Power Vdc	+15	+15
mA	12	13 Max.

Note: Care should always be taken to effectively ground the case of each unit.

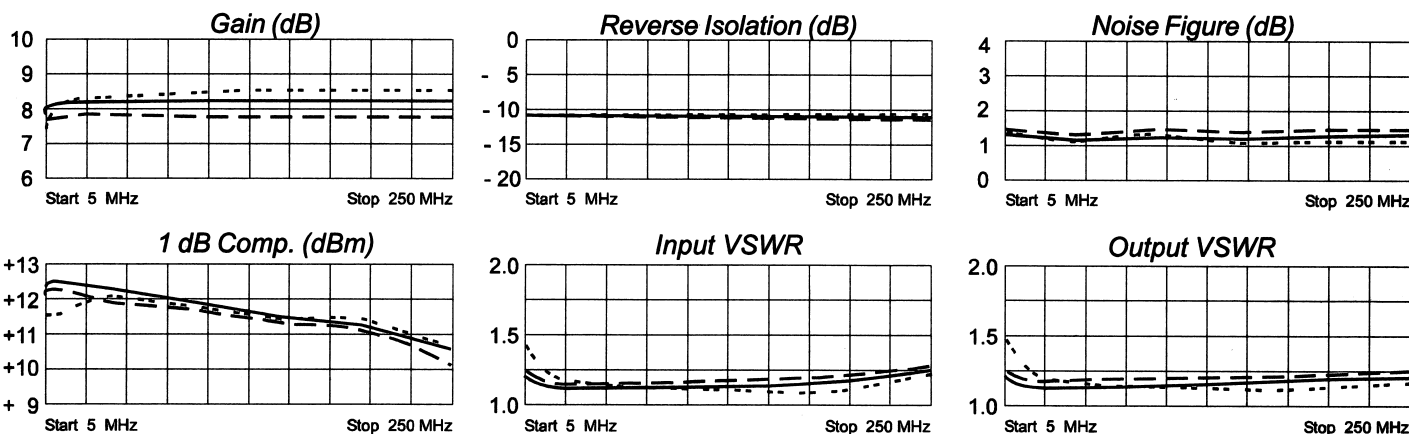
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.08	167	2.50	9	.28	9	.09	166
10	.07	164	2.53	3	.28	3	.07	160
50	.05	176	2.55	-10	.29	-10	.06	164
100	.05	-177	2.56	-22	.28	-22	.06	154
150	.06	-163	2.56	-34	.28	-32	.07	149
200	.08	-155	2.56	-46	.27	-44	.08	145
250	.12	-155	2.56	-58	.27	-56	.10	147

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RF AMPLIFIER

MODEL *TM6118*

Available as: TM6118, 4 Pin TO-8 (T4)
 TN6118, 4 Pin Surface Mount (SM3)
 FP6118, 4 Pin Flatpack (FP4)
 BX6118, Connectorized Housing (H1)

Features

- Low Noise: <2 dB Typical
- High Intercept: >+33 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 200 MHz	10 - 200 MHz
Gain (dB)	10	10 ± .6 Min.
Power @ 1 dB Comp. (dBm)	+18	+16.5 Min.
Reverse Isolation (dB)	- 12.5	- 12 Max.
VSWR In	1.2:1	2.0:1 Max.
Out	1.2:1	2.0:1 Max.
Noise figure (dB)	1.5	2.0 Max.
Power Vdc	+15	+15
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

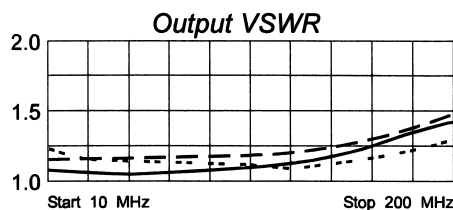
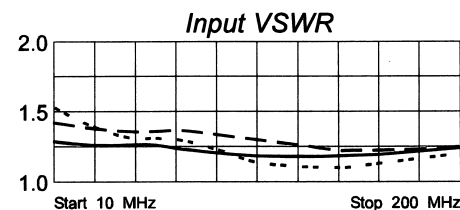
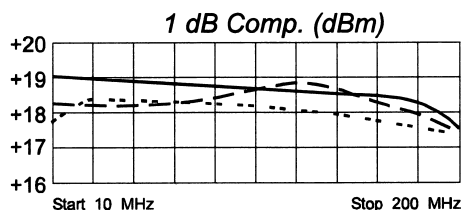
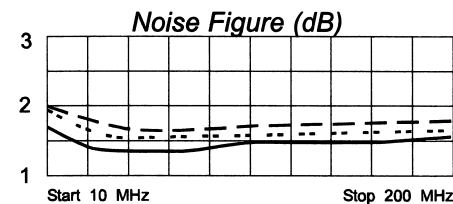
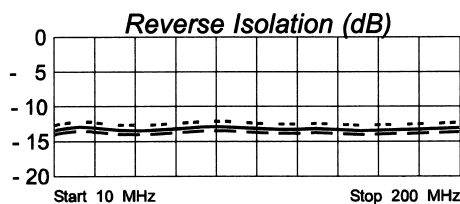
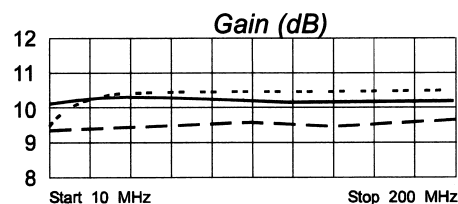
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +59 (Typ.)
 Second Order Two Tone Intercept Point +55 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.14	169	3.18	4	.23	4	.05	112
25	.12	171	3.24	-5	.23	-4	.02	92
50	.12	171	3.23	-14	.23	-12	.02	108
100	.09	172	3.21	-29	.23	-27	.05	125
150	.08	-164	3.24	-44	.22	-42	.10	122
200	.12	-135	3.22	-61	.21	-57	.17	113

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RF AMPLIFIER

MODEL *TM6119*

Available as: TM6119, 4 Pin TO-8 (T4)
 TN6119, 4 Pin Surface Mount (SM3)
 FP6119, 4 Pin Flatpack (FP4)
 BX6119, Connectorized Housing (H1)

Features

- High Output Power: +23 dBm Midband Typ.
- High Third Order Intercept: +40 dBm Midband Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	30 - 250 MHz	30 - 250 MHz
Gain (dB)	8 ± 0.5	6.5 Min.
Power @ 1 dB Comp. (dBm)	+23	+20.0 Min.
Reverse Isolation (dB)	- 13	- 12 Max.
VSWR In	1.7:1	2.3:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	3.0	3.5 Max.
Power Vdc	+15	+15
mA	43	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

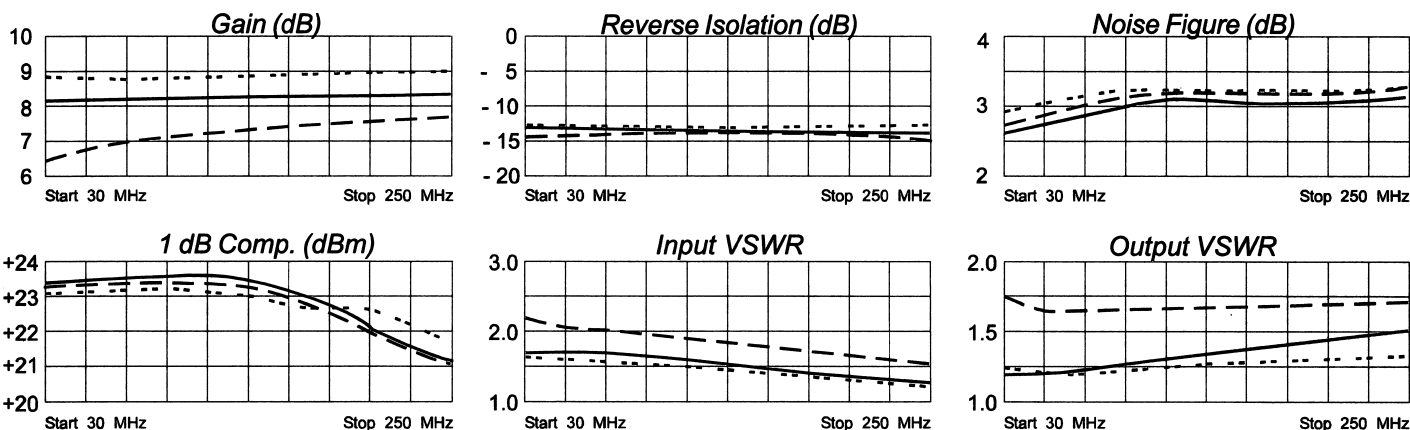
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
30	.25	166	2.63	- 4	.22	- 5	.08	117
50	.24	160	2.62	-11	.22	-12	.09	109
100	.23	143	2.59	-25	.21	-26	.13	86
150	.20	126	2.61	-38	.21	-40	.18	70
200	.16	112	2.61	-52	.20	-54	.21	60
250	.11	107	2.63	-66	.20	-68	.22	52

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RF AMPLIFIER

MODEL *TM6121*

Available as: TM6121, 4 Pin TO-8 (T4)
 TN6121, 4 Pin Surface Mount (SM3)
 FP6121, 4 Pin Flatpack (FP4)
 BX6121, Connectorized Housing (H1)
 PN6121, Reduced Size Surface Mount (SM11)

Features

- High Intercept: > +37 dBm Typical
- Low Noise Figure: < 3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 200 MHz	20 - 200 MHz
Gain (dB)	10	10 ± .6
Power @ 1 dB Comp. (dBm)	+20	+18.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3	4.0 Max.
Power Vdc	+15	+15
mA	60	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

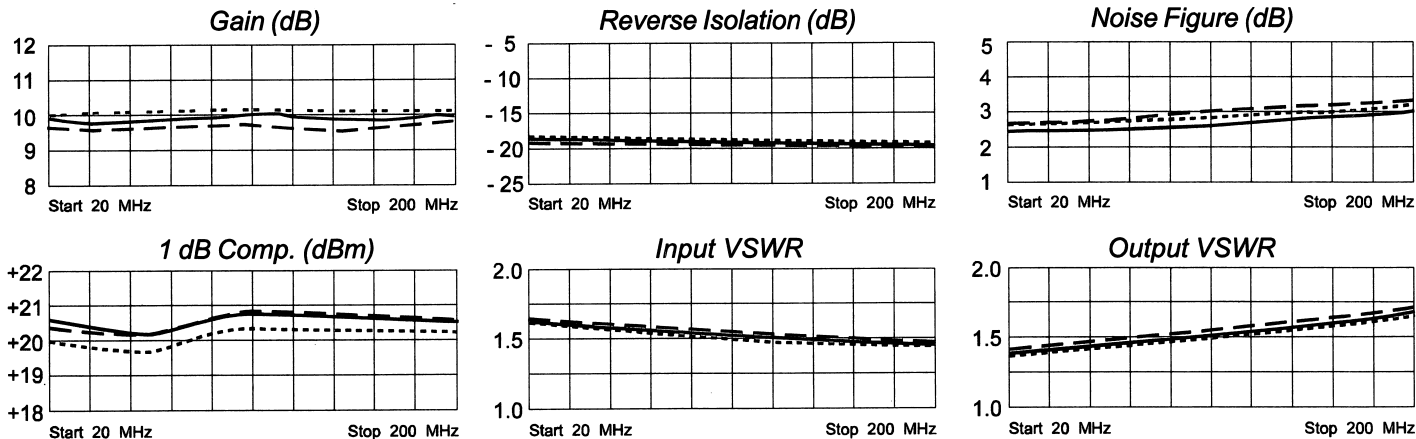
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +60 (Typ.)
 Second Order Two Tone Intercept Point +55 (Typ.)
 Third Order Two Tone Intercept Point +38 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 17 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.20	-148	3.10	-174	.11	-175	.21	-169
20	.19	-166	3.12	178	.12	176	.22	-176
50	.18	176	3.09	165	.11	163	.22	176
100	.18	161	3.07	147	.11	143	.23	-165
150	.18	151	3.08	130	.11	126	.24	155
200	.20	139	3.10	112	.11	108	.24	148
300	.25	108	3.01	71	.09	78	.30	143

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RF AMPLIFIER

MODEL *TM6131*

Available as: TM6131, 4 Pin TO-8 (T4)
 TN6131, 4 Pin Surface Mount (SM3)
 FP6131, 4 Pin Flatpack (FP4)
 BX6131, Connectorized Housing (H1)

Features

- High Intercept: +37 dBm Typical
- High Output Power: +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	10 - 500 MHz
Gain (dB)	10.3	9 min/ 11 max
Power @ 1 dB Comp. (dBm)	+20	+18.0 Min.
Reverse Isolation (dB)	- 22	- 20 Max.
VSWR In	1.25:1	2.0:1 Max.
Out	1.25:1	2.0:1 Max.
Noise figure (dB)	4.5	6.5 Max.
Power Vdc	+15	+15
mA	62	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

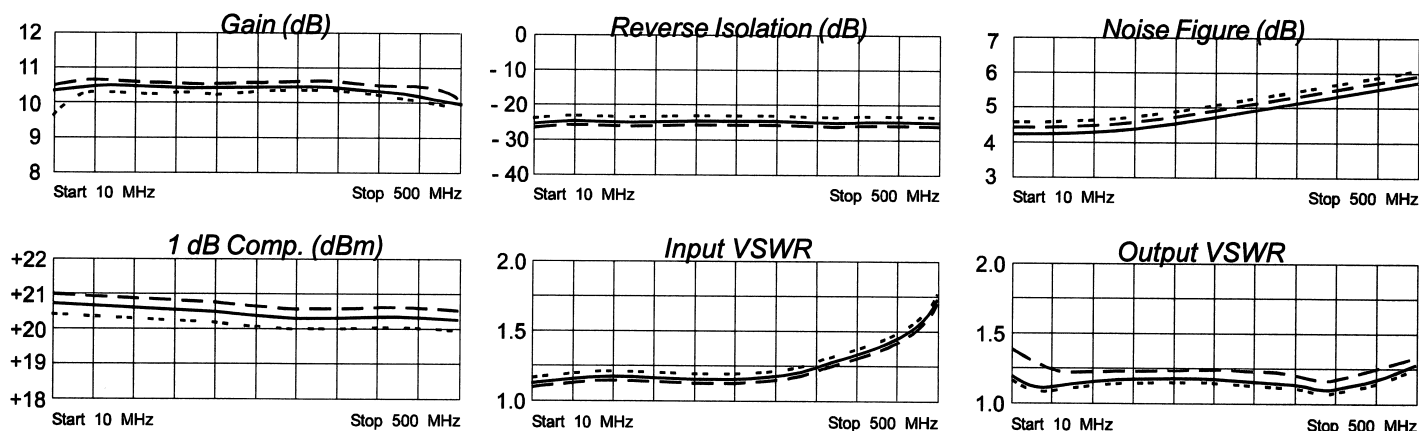
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +37 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	- 41	3.39	-156	.08	-157	.09	-105
50	.07	- 16	3.49	168	.08	167	.05	149
100	.06	- 17	3.47	152	.08	149	.06	105
200	.05	- 47	3.50	123	.08	119	.09	48
300	.05	-133	3.55	94	.09	91	.08	- 11
400	.14	159	3.57	61	.10	64	.07	- 87
500	.29	120	3.40	25	.11	35	.10	-178

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RF AMPLIFIER

MODEL *TM6134*

Available as: TM6134, 4 Pin TO-8 (T4)
 TN6134, 4 Pin Surface Mount (SM3)
 FP6134, 4 Pin Flatpack (FP4)
 BX6134, Connectorized Housing (H1)

Features

- High Output Power: +26 dBm Typ.
- High Dynamic Range: $I_{p3} = +39$ dBm Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		20 - 200 MHz	20 - 200 MHz
Gain (dB)		14.3	12.5 Min.
Power @ 1 dB Comp. (dBm)		+26	+23.0 Min.
Reverse Isolation (dB)		- 17	- 15 Max.
VSWR	In	1.60:1	2.5:1 Max.
	Out	1.35:1	2.5:1 Max.
Noise figure (dB)		4	6.0 Max.
Power	Vdc	+15	+15
	mA	90	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

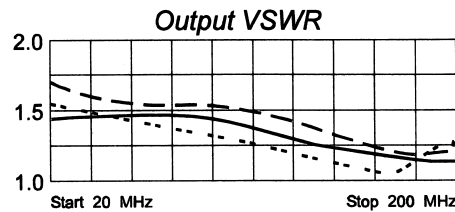
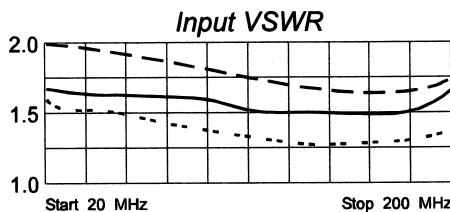
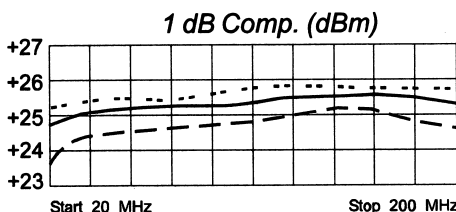
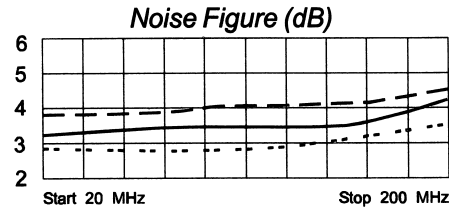
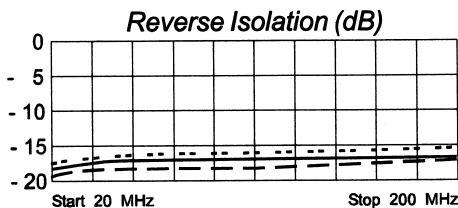
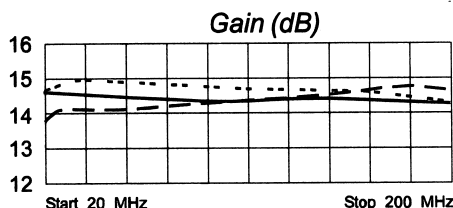
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +58 (Typ.)
 Second Order Two Tone Intercept Point +54 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.25	-179	5.27	180	.13	179	.17	7
50	.24	175	5.23	165	.13	163	.17	-10
100	.23	173	5.19	146	.13	144	.13	-34
150	.26	178	5.17	127	.14	125	.07	-80
200	.33	178	5.11	108	.15	107	.08	162

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RF AMPLIFIER

MODEL *TM6143*

Available as: TM6143, 4 Pin TO-8 (T4)
 TN6143, 4 Pin Surface Mount (SM3)
 FP6143, 4 Pin Flatpack (FP4)
 BX6143, Connectorized Housing (H1)

Features

- High Gain: 15.7 dB Typical
- Low Noise: 1.6 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15.7	14.5 Min.
Power @ 1 dB Comp. (dBm)	+7.5	+5.0 Min.
Reverse Isolation (dB)	- 19	- 16 Max.
VSWR In	1.7:1	2.5:1 Max.
Out	1.6:1	2.5:1 Max.
Noise figure (dB)	1.6	2.5 Max.
Power Vdc	+15	+15
mA	14.5	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

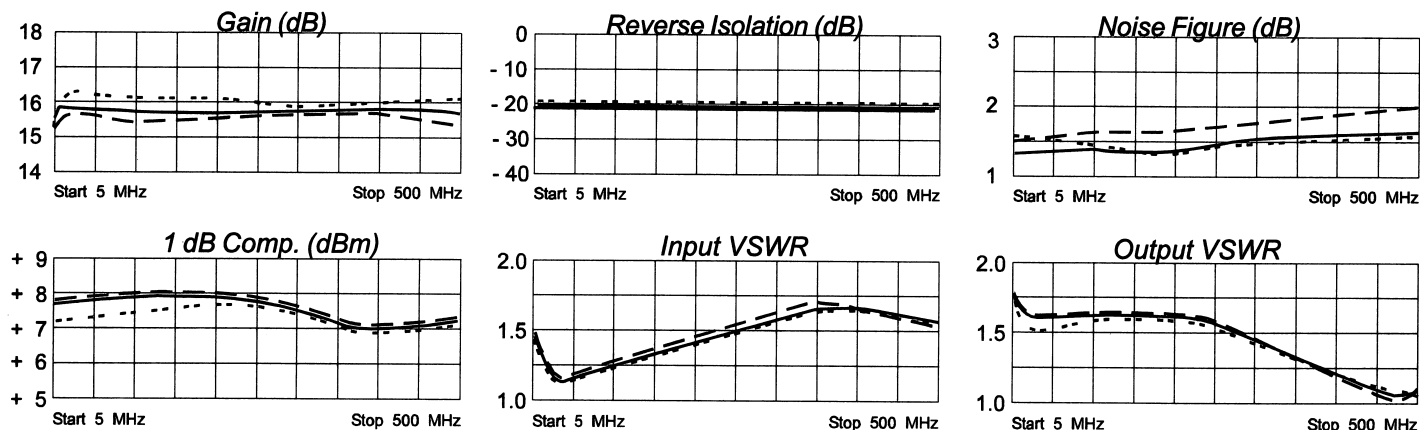
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	- 65	6.00	-165	.09	-165	.28	- 23
50	.08	- 72	6.14	167	.10	165	.24	- 26
100	.11	- 92	6.12	153	.10	147	.23	- 46
200	.18	-120	6.11	124	.10	117	.22	- 85
300	.23	-143	6.14	95	.11	89	.19	-122
400	.25	-171	6.25	64	.11	65	.09	-158
500	.22	145	6.07	27	.11	41	.04	- 3

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RF AMPLIFIER

MODEL *TM6145*

Available as: TM6145, 4 Pin TO-8 (T4)
 TN6145, 4 Pin Surface Mount (SM3)
 FP6145, 4 Pin Flatpack (FP4)
 BX6145, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- Midband Output Power: +19 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	10.7	10.0 Min.
Power @ 1 dB Comp. (dBm)	+19	+16.0 Min.
Reverse Isolation (dB)	- 12	- 11 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	<2.5:1	3.0:1 Max.
Noise figure (dB)	3.0	5.0 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

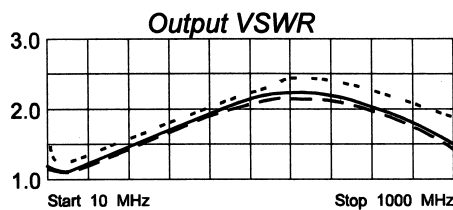
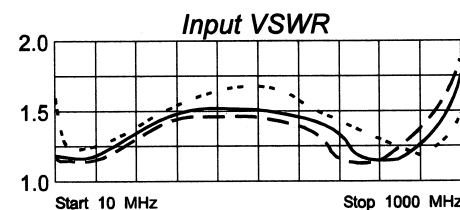
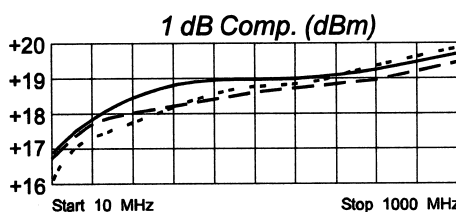
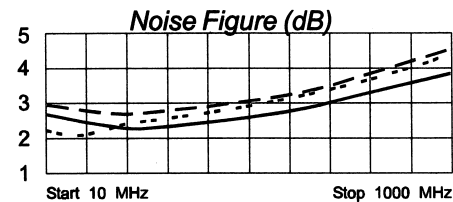
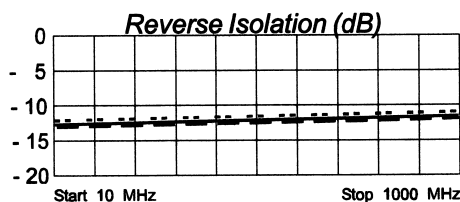
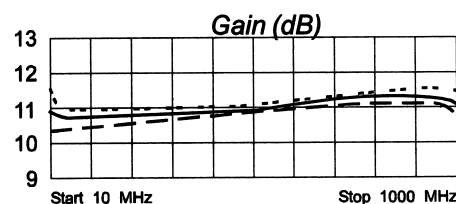
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	113	3.52	-165	.22	-169	.12	100
100	.10	81	3.52	169	.22	169	.13	77
200	.15	56	3.50	155	.22	155	.21	56
400	.21	20	3.50	128	.22	132	.35	25
600	.18	- 16	3.57	102	.23	111	.42	- 9
800	.07	-101	3.73	73	.25	89	.39	- 49
1000	.27	121	3.73	38	.28	63	.27	-108

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RF AMPLIFIER

MODEL *TM6147*

Available as: TM6147, 4 Pin TO-8 (T4)
 TN6147, 4 Pin Surface Mount (SM3)
 FP6147, 4 Pin Flatpack (FP4)
 BX6147, Connectorized Housing (H1)

Features

- Medium Gain: 17 dB Typical
- High Output Power: +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	17	16.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+17.5 Min.
Reverse Isolation (dB)	- 19	- 17 Max.
VSWR In Out	<1.75:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	<3.0	4.5 Max.
Power Vdc mA	+15 50	+15 55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

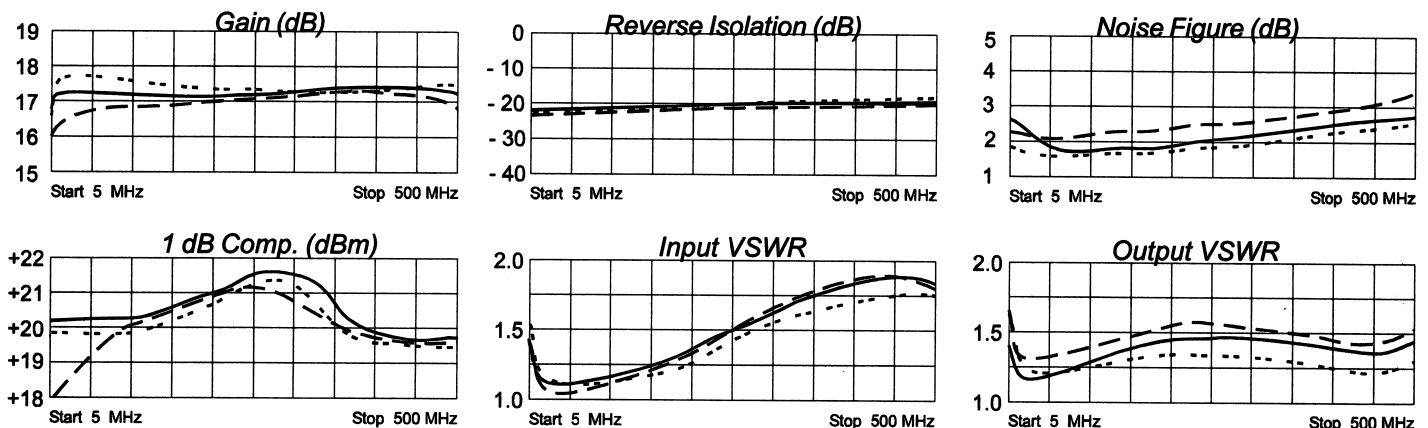
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	- 76	6.84	-156	.09	-155	.15	- 33
50	.04	- 87	7.19	166	.09	163	.08	- 20
100	.07	- 94	7.15	148	.09	145	.12	23
200	.15	-123	7.16	114	.10	108	.18	3
300	.24	-159	7.21	80	.11	75	.18	- 30
400	.29	155	7.38	43	.11	41	.16	- 82
500	.29	89	7.30	1	.11	5	.19	-161

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RF AMPLIFIER

MODEL *TM6149*

Available as: TM6149, 4 Pin TO-8B (T4)
 TN6149-3, 4 Pin Surface Mount (SM3)
 FP6149-4, 4 Pin Flatpack (FP4)
 BX6149, Connectorized Housing (H1)
 PN6149, Reduced Size Surface Mount (SM11)

Features

- Medium Gain: 15.3 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15.3	14.5 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.5 Min.
Reverse Isolation (dB)	-19	-18 Max.
VSWR In	<1.25:1	2:0:1 Max.
Out	<1.25:1	2:0:1 Max.
Noise figure (dB)	<5.0	6.0 Max.
Power Vdc	+15	+15
mA	45	48 Max.

Note: Care should always be taken to effectively ground the case of each unit.

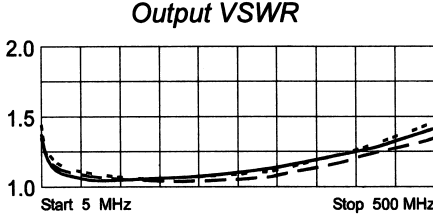
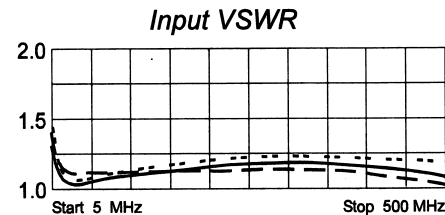
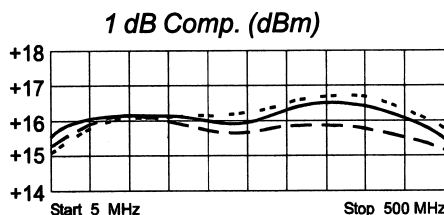
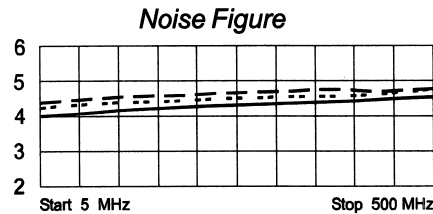
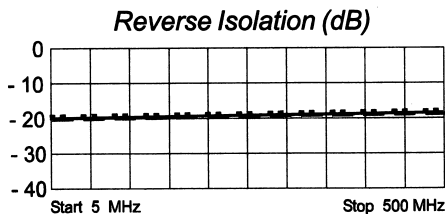
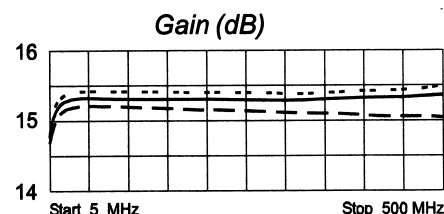
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +47 (Typ.)
 Second Order Two Tone Intercept Point +41 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power.....0.5 Watts
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHZ	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	-66	5.58	-167	.09	13	.14	119
50	.02	22	5.85	172	.09	1	.01	93
100	.03	49	5.81	161	.09	-2	.01	-171
200	.07	52	5.78	141	.10	-7	.03	-160
300	.08	44	5.75	121	.10	-12	.05	169
400	.08	41	5.75	101	.11	-17	.09	140
500	.05	50	5.71	79	.12	-25	.14	110
600	.06	136	5.67	56	.13	-34	.22	77

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04/18/03

RF AMPLIFIER

MODEL *TM6153*

Available as: TM6153, 4 Pin TO-8 (T4)

TN6153-3, 4 Pin Surface Mount (SM3)

FP6153-4, 4 Pin Flatpack (FP4)

BX6153, Connectorized Housing (H1)

PN6153, Reduced Size Surface Mount (SM11)

Features

- GaAs FET: Low Noise Figure: <3 dB Typical
- Medium Output Power: >+7 dBm Typical
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	300-1800 MHz	300-1800 MHz
Gain (dB)	11.5	10.5 Min.
Power @ 1 dB Comp. (dBm)	> +7	+6.0 Min.
Reverse Isolation (dB)	- 17	-15 Max.
VSWR In	<2.5:1	3.0:1 Max.
Out	<2.0:1	2.5:1 Max.
Noise figure (dB)	<3	4.0 Max.
Power Vdc	+15	+15
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +28 (Typ.)

Second Order Two Tone Intercept Point +22 (Typ.)

Third Order Two Tone Intercept Point +18 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 18 Volts

Continuous RF Input Power + 10 dBm

Short Term RF Input Power 50 Milliwatts

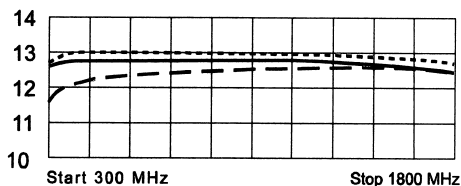
..... (1 Minute Max.)

Maximum Peak Power 0.5 Watt

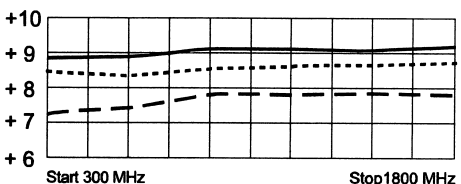
(3 µsec Max.)

Typical Performance Data

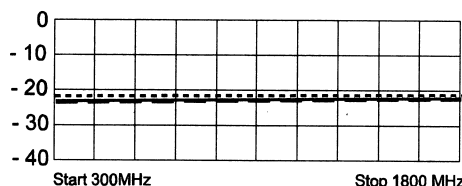
Gain (dB)



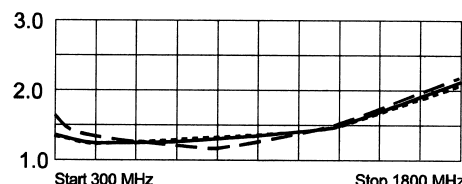
1 dB Comp. (dBm)



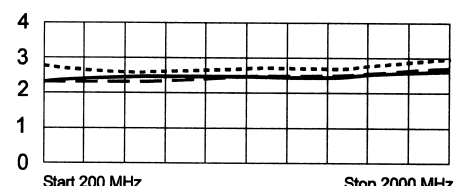
Reverse Isolation (dB)



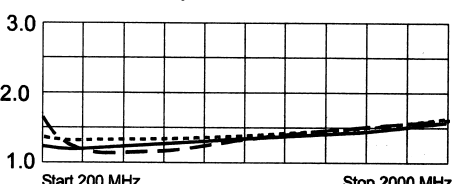
Input VSWR



Noise Figure (dB)



Output VSWR



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
300	.27	-41	3.83	148	.11	-14	.05	25
400	.29	-53	3.79	138	.11	-19	.06	12
600	.33	-76	3.74	117	.11	-30	.07	-15
800	.38	-96	3.67	97	.11	-40	.06	-36
1000	.39	-117	3.72	78	.11	-49	.07	-41
1400	.38	-137	3.83	56	.12	-60	.06	-58
1600	.32	-163	4.02	31	.12	-75	.05	-55
1800	.20	140	4.14	1	.13	-94	.05	-22
	.28	22	4.13	-31	.14	-118	.22	-21

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RF AMPLIFIER

MODEL *TM6155*

Available as: TM6155, 4 Pin TO-8 (T4)
 TN6155, 4 Pin Surface Mount (SM3)
 FP6155, 4 Pin Flatpack (FP4)
 BX6155, Connectorized Housing (H1)

Features

- Medium Gain: 12.5 dB Typical
- High Output Power: > +19.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	300 - 1000 MHz	300 - 1000 MHz
Gain (dB)	12.5	10.5 Min.
Power @ 1 dB Comp. (dBm)	+19.5	+18.0 Min.
Reverse Isolation (dB)	- 13	- 12 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<2.0:1	3.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+15	+15
mA	50	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

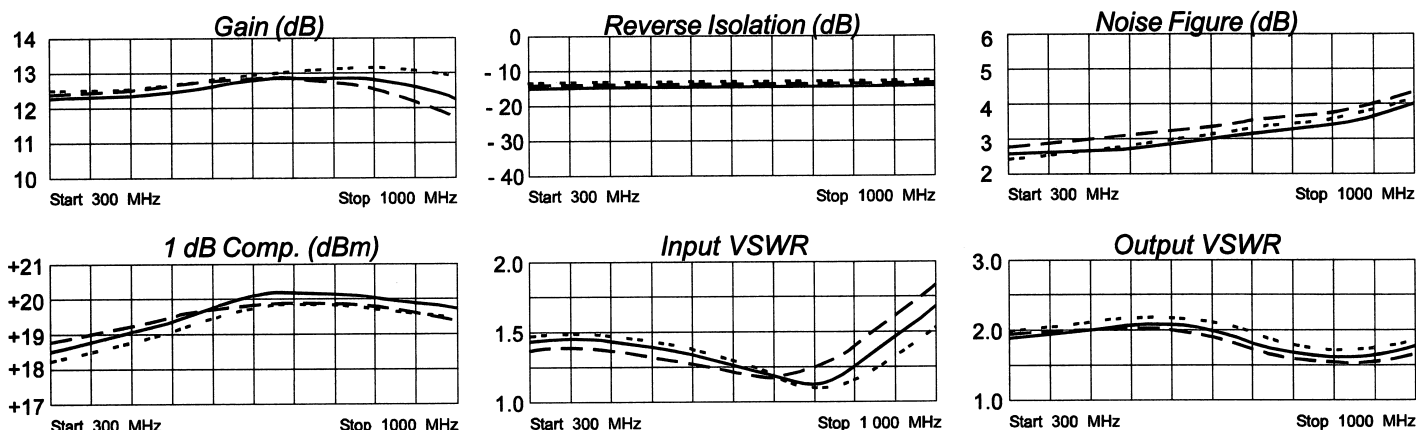
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
200	.18	91	4.15	144	.17	148	.28	8
300	.18	56	4.16	126	.18	130	.31	1
400	.18	23	4.16	107	.18	115	.33	- 9
500	.17	- 10	4.26	88	.18	99	.34	- 23
600	.13	- 47	4.34	69	.19	83	.33	- 39
800	.08	172	4.42	25	.21	48	.25	- 87
1000	.25	52	4.15	- 23	.22	7	.21	173

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RF AMPLIFIER

MODEL *TM6157*

Available as: TM6157, 4 Pin TO-8 (T4)
 TN6157, 4 Pin Surface Mount (SM3)
 FP6157, 4 Pin Flatpack (FP4)
 BX6157, Connectorized Housing (H1)

Features

- Medium Gain: 13 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 500 MHz	20 - 500 MHz
Gain (dB)	13	10.5 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 23.5	- 22.5 Max.
VSWR In	<1.2:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<7.5	8.5 Max.
Power Vdc	+15	+15
mA	75	85 Max.

Note: Care should always be taken to effectively ground the case of each unit.

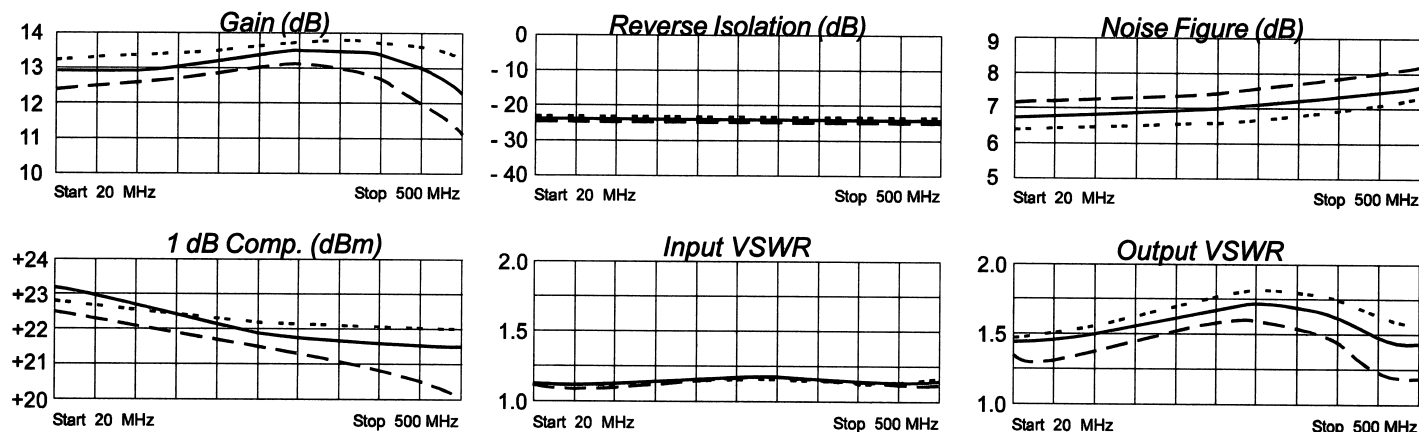
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.06	-138	4.40	-170	.06	-170	.18	- 13
20	.05	-156	4.42	-180	.06	-179	.17	- 11
100	.06	-157	4.41	152	.06	150	.19	- 39
200	.08	-158	4.50	122	.06	122	.23	- 78
300	.09	-175	4.63	89	.06	91	.26	-117
400	.08	158	4.57	51	.06	68	.23	-164
500	.05	101	4.04	10	.05	42	.16	107

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RF AMPLIFIER

MODEL *TM6160*

Available as: TM6160, 4 Pin TO-8 (T4)
 TN6160-3, 4 Pin Surface Mount (SM3)
 FP6160-4, 4 Pin Flatpack (FP4)
 BX6160, Connectorized Housing (H1)

Features

- High Gain: 28 dB Typical
- Low Noise Figure: <2 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100-600 MHz	100-600 MHz
Gain (dB)	28	26 Min.
Power @ 1 dB Comp. (dBm)	+17	+16 Min.
Reverse Isolation (dB)	- 43	- 40 Max.
VSWR In Out	<1.75:1 <1.75:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	<2	3.0 Max.
Power Vdc mA	+15 65	+15 75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

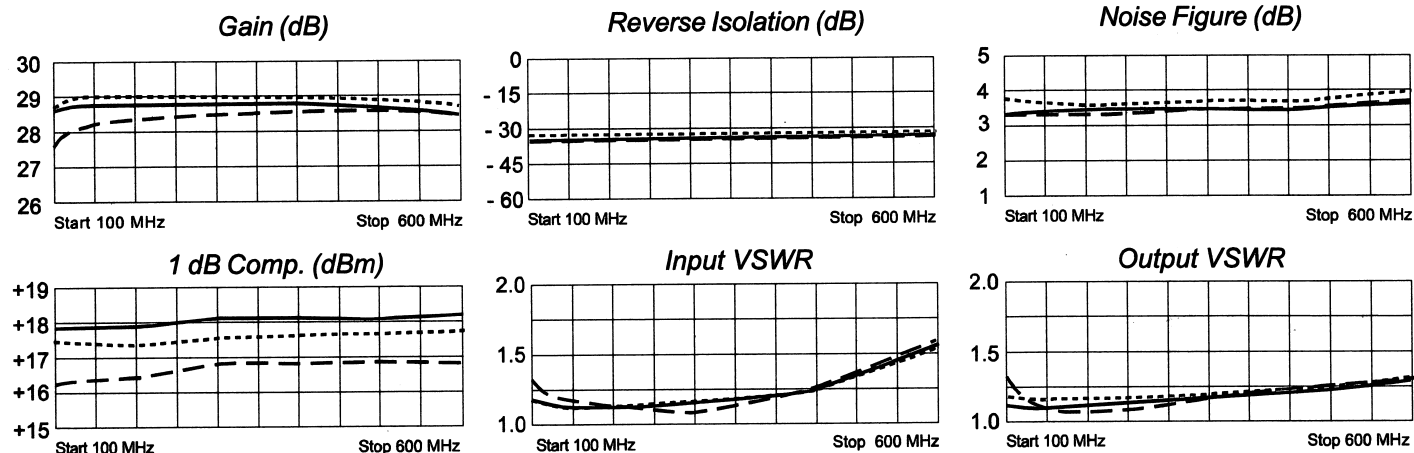
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +10 dBm
 Short Term RF Input Power 20 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.1 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
50	.12	-168	25.49	-17	.01	-16	.13	-17
100	.16	-158	25.77	-48	.01	-51	.16	-50
200	.21	-175	25.09	-103	.01	-105	.20	-94
300	.16	175	24.57	-156	.01	-159	.22	-121
400	.15	-159	24.23	150	.01	162	.22	-145
500	.25	-176	24.57	93	.01	127	.17	-166
600	.31	115	25.28	28	.01	75	.08	-161

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RF AMPLIFIER

MODEL *TM6162*

Available as: TM6162, 4 Pin TO-8 (T4)
 TN6162, 4 Pin Surface Mount (SM3)
 FP6162, 4 Pin Flatpack (FP4)
 BX6162, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.4 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 125 MHz	10 - 100 MHz
Gain (dB)	12.7	11.5 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.0 Min.
Reverse Isolation (dB)	- 15.5	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<1.4	2.0 Max.
Power Vdc	+15	+15
mA	11	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

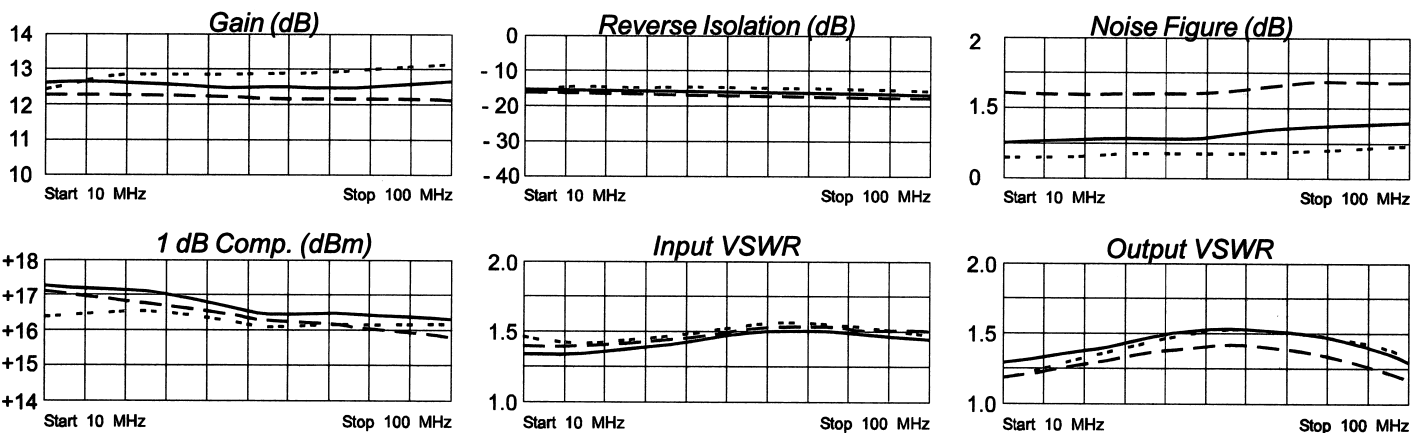
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.15	-179	4.27	4	.17	2	.10	12
10	.15	-180	4.32	- 4	.17	- 4	.12	- 12
50	.19	179	4.29	- 43	.16	- 41	.20	- 96
100	.19	162	4.31	- 92	.14	- 87	.12	-167
150	.40	-175	3.46	-161	.08	-153	.47	- 29

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RF AMPLIFIER

MODEL *TM6171*

Available as: TM6171, 4 Pin TO-8 (T4)
 TN6171, 4 Pin Surface Mount (SM3)
 FP6171, 4 Pin Flatpack (FP4)
 BX6171, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.3 dB Typical
- High Gain: 15.2 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15.2	14.0 Min.
Power @ 1 dB Comp. (dBm)	+0.5	- 2 Min.
Reverse Isolation (dB)	- 21	- 20 Max.
VSWR In	<1.6:1	2.0:1 Max.
Out	<1.4:1	2.0:1 Max.
Noise figure (dB)	2.3	3.0 Max.
Power Vdc	+15	+15
mA	11	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

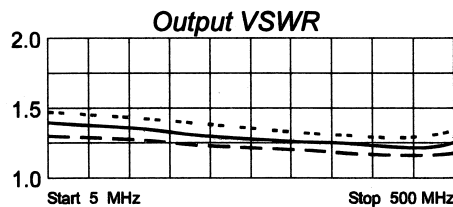
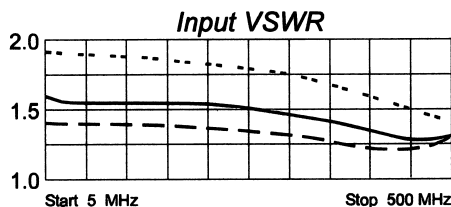
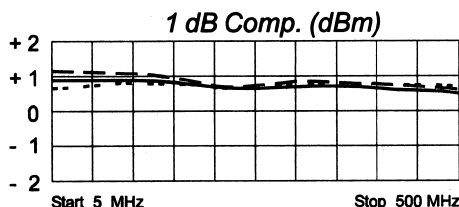
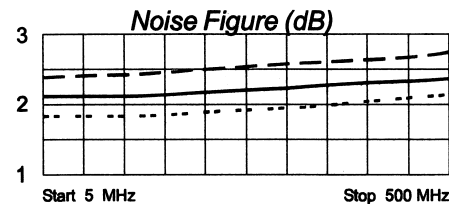
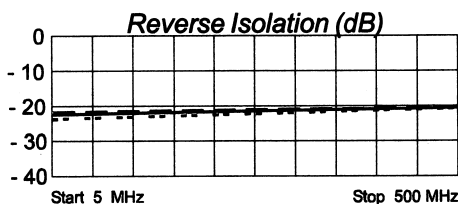
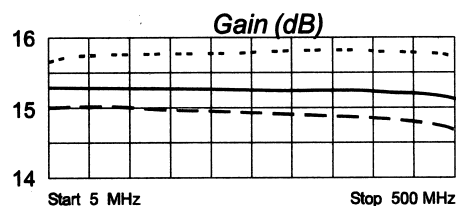
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +21 (Typ.)
 Second Order Two Tone Intercept Point +15 (Typ.)
 Third Order Two Tone Intercept Point +12 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.22	-175	5.74	-178	.07	4	.16	-175
50	.21	165	5.75	167	.07	- 2	.16	170
100	.21	150	5.73	153	.08	- 5	.15	160
200	.20	123	5.71	127	.08	- 11	.13	138
300	.18	102	5.73	99	.08	-18	.12	114
400	.14	95	5.75	70	.09	-28	.10	84
500	.13	126	5.71	38	.09	-40	.11	35
600	.29	136	5.37	2	.10	-53	.16	- 17

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RF AMPLIFIER

MODEL *TM6176*

Available as: TM6176, 4 Pin TO-8 (T4)
 TN6176, 4 Pin Surface Mount (SM3)
 FP6176, 4 Pin Flatpack (FP4)
 BX6176, Connectorized Housing (H1)

Features

- Medium Noise Figure: <4 dB Typical
- Medium Output Power: +14 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	13.5	12.0 Min.
Power @ 1 dB Comp. (dBm)	+14	+12.0 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.0 Max.
Power Vdc	+15	+15
mA	38	41 Max.

Note: Care should always be taken to effectively ground the case of each unit.

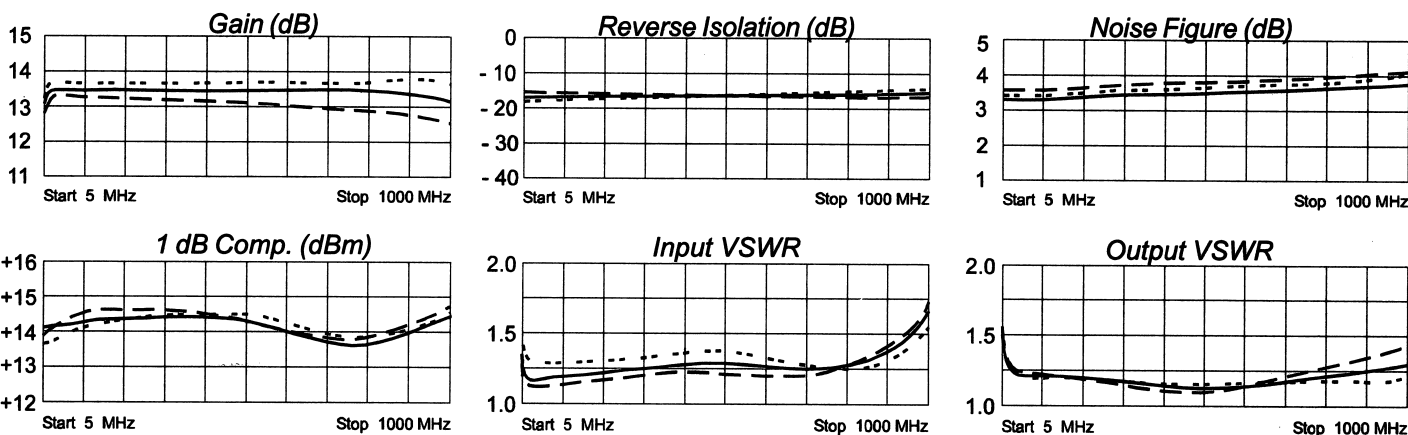
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.12	- 51	4.60	-170	.11	10	.17	144
50	.05	1	4.73	173	.11	- 1	.09	165
100	.06	18	4.72	164	.11	- 3	.08	165
200	.08	26	4.71	148	.12	- 6	.07	159
400	.14	12	4.70	115	.12	-15	.04	168
600	.16	- 25	4.65	81	.13	-25	.04	-140
800	.14	- 93	4.49	46	.13	-38	.07	-124
1000	.23	172	4.23	6	.13	-52	.14	-118

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RF AMPLIFIER

MODEL *TM6182*

Available as: TM6182, 4 Pin TO-8 (T4)
 TN6182, 4 Pin Surface Mount (SM3)
 FP6182, 4 Pin Flatpack (FP4)
 BX6182, Connectorized Housing (H1)
 PN6182, Reduced Size Surface Mount (SM11)

Features

- High Gain: 28.5 dB Typical
- Low Noise Figure: 2.7 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	28.5	27.2 Min.
Power @ 1 dB Comp. (dBm)	+15	+9 Min.
Reverse Isolation (dB)	- 36	- 33 Max.
VSWR In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	2.7	4.5 Max.
Power Vdc mA	+15 44	+15 50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

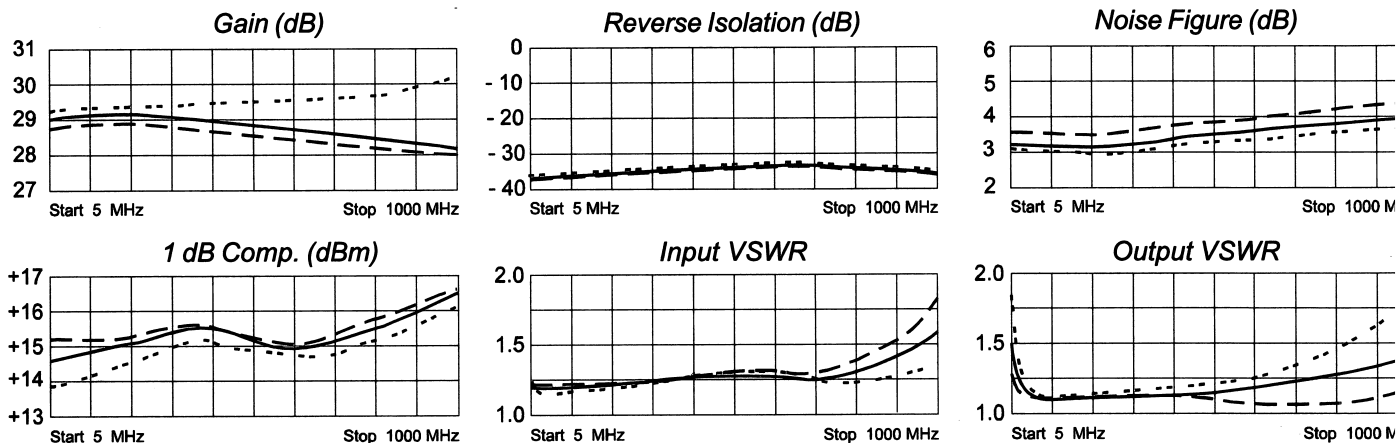
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +33 (Typ)
 Second Order Two Tone Intercept Point +31 (Typ)
 Third Order Two Tone Intercept Point +22 (Typ)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Maximum)
 Maximum Peak Power 0.2 Watt
 (3 µsec Maximum)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-155	4.96	-173	.12	8	.25	164
50	.22	-179	5.06	176	.12	3	.22	164
100	.22	175	5.06	169	.12	2	.21	155
250	.21	158	5.06	150	.12	1	.22	128
500	.18	135	5.04	121	.14	- 0	.23	82
750	.13	117	5.12	91	.15	- 6	.24	42
1000	.08	121	5.21	59	.16	-14	.21	6
1250	.10	153	5.16	23	.17	-21	.17	- 26
1500	.16	146	4.70	- 17	.18	-29	.11	- 40

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RF AMPLIFIER

MODEL *TM6183*

Available as: TM6183, 4 Pin TO-8 (T4)
 TN6183, 4 Pin Surface Mount (SM3)
 FP6183, 4 Pin Flatpack (FP4)
 BX6183, Connectorized Housing (H1)
 PN6183, Reduced Size Surface Mount (SM11)

Features

- High Gain: 29 dB Typical
- Low Noise Figure: <4 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		10 - 1000 MHz	10 - 1000 MHz
Gain (dB)		29.0	28.0 Min.
Power @ 1 dB Comp. (dBm)		+15	+13.5 Min.
Reverse Isolation (dB)		- 36	- 34 Max.
VSWR	In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		<4.0	5.0 Max.
Power	Vdc mA	+15 70	+15 83 Max.

Note: Care should always be taken to effectively ground the case of each unit.

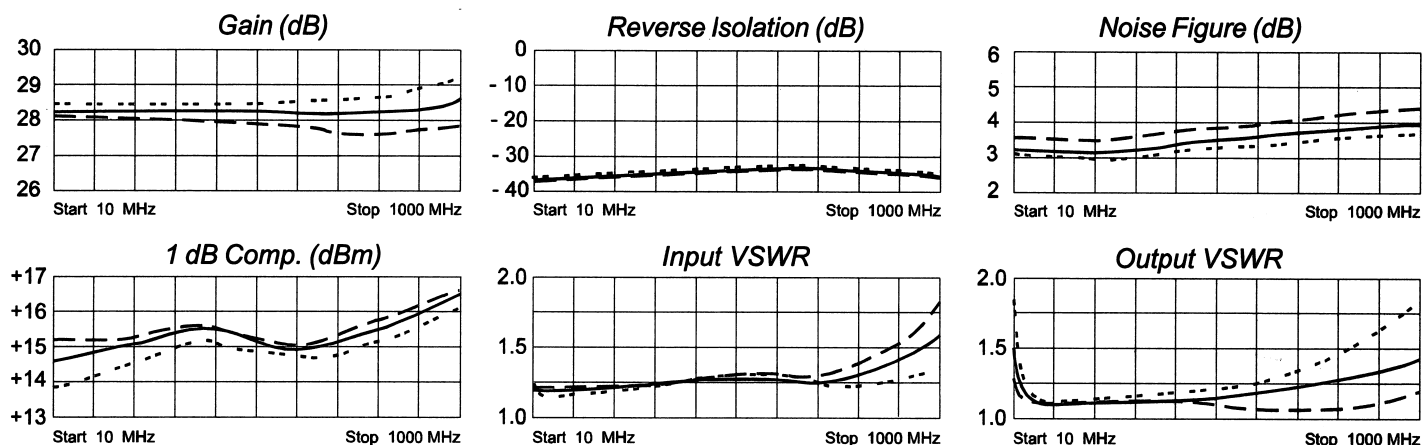
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.18	33	22.77	23	.01	24	.36	113
10	.19	13	23.76	10	.01	12	.17	99
50	.18	-10	23.90	-9	.02	8	.05	76
100	.18	-22	23.93	-21	.01	2	.04	66
200	.17	-47	24.04	-44	.01	3	.04	54
400	.15	-93	23.87	-89	.01	-6	.04	41
600	.12	-129	23.38	-134	.02	1	.05	75
800	.10	-130	23.59	-178	.02	-12	.12	91
1000	.24	-135	25.96	132	.02	-26	.31	62

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RF AMPLIFIER

MODEL **TM6184**

Available as: TM6184, 4 Pin TO-8 (T4)
 TN6184-3 4 Pin Surface Mount (SM3)
 FP6184-4, 4 Pin Flatpack (FP4)
 BX6184, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Output Power: +11 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10-2000 MHz	10-2000 MHz
Gain (dB)	19.5	18.0 Min.
Power @ 1 dB Comp. (dBm)	>+11	+10.0 Min.
Reverse Isolation (dB)	-30	- 25 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+15	+15
mA	54	60 Max.

Note: Care should always be taken to effectively ground the case of each unit.

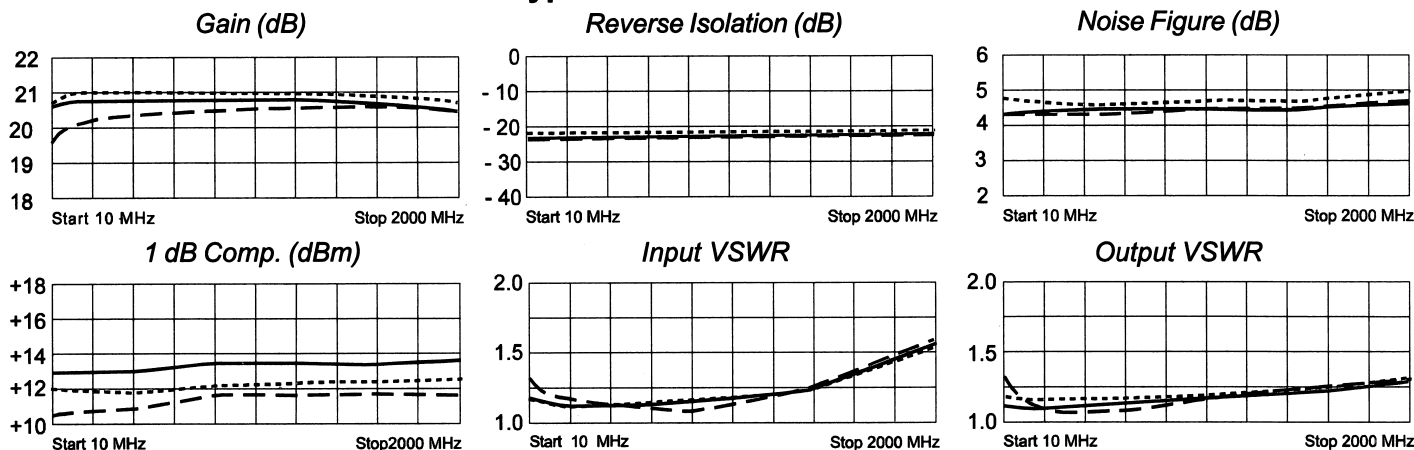
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43(Typ.)
 Second Order Two Tone Intercept Point +37(Typ.)
 Third Order Two Tone Intercept Point +23(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 20 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	-168	9.97	3	.03	4	.06	163
50	.03	-143	9.90	-9	.03	0	.06	-158
100	.05	-130	9.85	-19	.03	-1	.08	-140
200	.09	-128	9.79	-39	.03	-3	.14	-135
400	.15	-142	9.60	-77	.03	-9	.23	-148
800	.17	-172	9.43	-152	.03	-13	.29	173
1200	.14	-162	9.39	130	.03	-28	.15	166
1600	.26	176	9.03	54	.03	-45	.25	-173
2000		60	9.64	-45	.05	-78	.23	102

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RF AMPLIFIER

MODEL *TM6191*

Available as: TM6191, 4 Pin TO-8 (T4)
 TN6191, 4 Pin Surface Mount (SM3)
 FP6191, 4 Pin Flatpack (FP4)
 BX6191, Connectorized Housing (H1)
 PN6191, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 2.5 dB Typical
- Medium Output Power: +20 dBm Min.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100 - 600 MHz	100 - 600 MHz
Gain (dB)	23.5	22.0 Min.
Power @ 1 dB Comp. (dBm)	+ 21.5	+20 Min.
Reverse Isolation (dB)	- 35	- 33 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.50:1	2.0:1 Max.
Noise figure (dB)	2.5	4.0 Max.
Power Vdc	+15	+15
mA	95	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

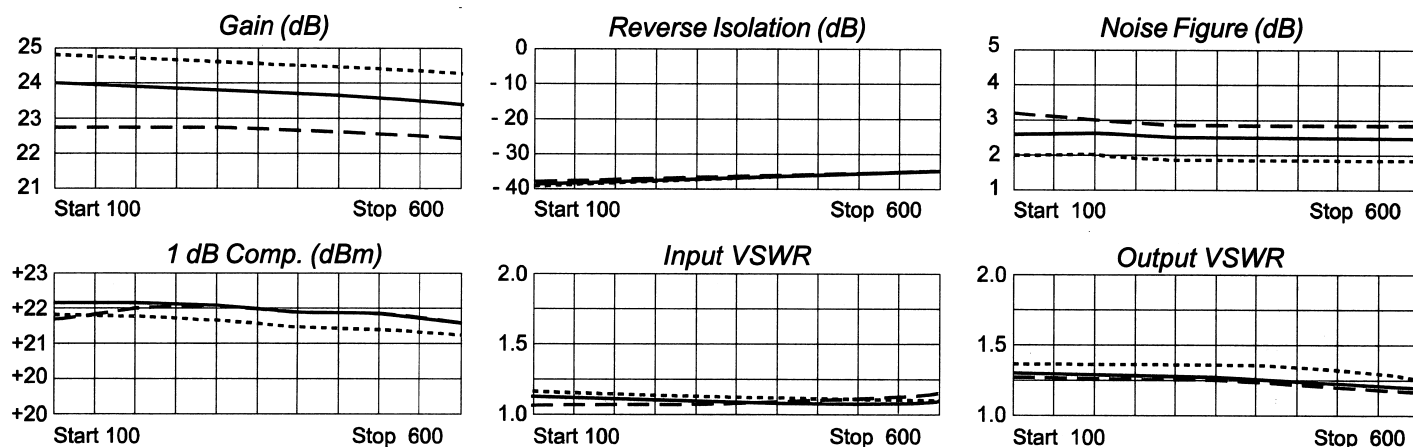
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +57 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
100	.05	175	15.95	-17	.0131	3	.12	-173
200	.04	175	15.83	-39	.0129	2	.09	173
300	.03	-179	15.73	-59	.0146	4	.13	162
400	.02	-170	15.60	-80	.0155	5	.14	177
500	.02	-139	15.42	-101	.0163	1	.10	-167
600	.01	-98	14.93	-122	.0172	-1	.04	148

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RF AMPLIFIER

MODEL *TM6198*

Available as: TM6198, 4 Pin TO-8 (T4)
 TN6198, 4 Pin Surface Mount (SM3)
 FP6198, 4 Pin Flatpack (FP4)
 BX6198, Connectorized Housing (H1)
 PN6198, Reduced Size Surface Mount (SM11)

Features

- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available
- 5 Volt Bias

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	15	13.5 Min.
Power @ 1 dB Comp. (dBm)	+20	+18.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.4:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+5	+5
mA	70	75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

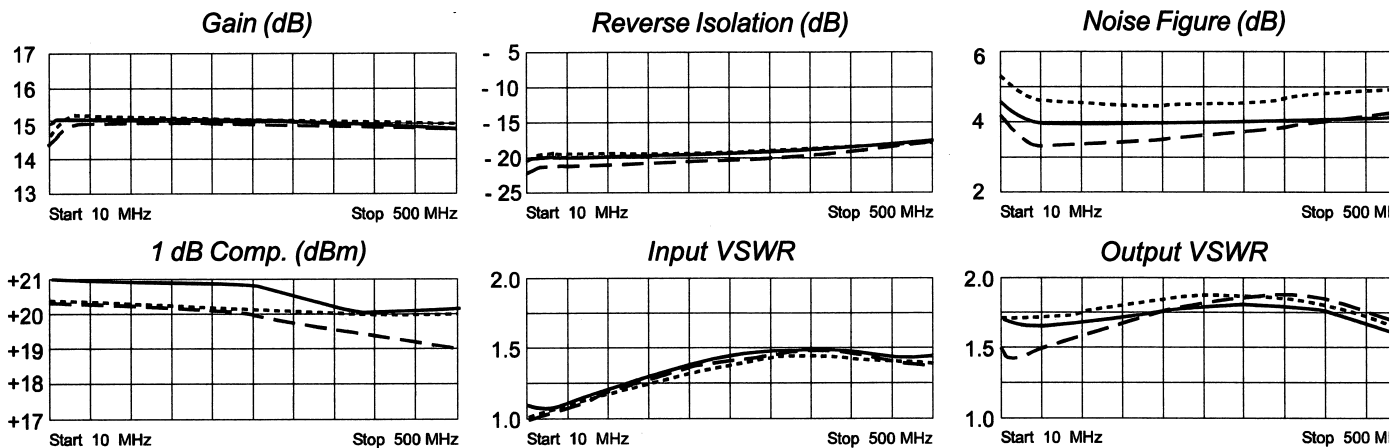
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +44(Typ)
 Second Order Two Tone Intercept Point +38(Typ)
 Third Order Two Tone Intercept Point +30(Typ)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °
 Storage Temperature -62°C to + 125 °
 Case Temperature + 125 °
 DC Voltage + 7 Vol
 Continuous RF Input Power + 13 dB
 Short Term RF Input Power 100 Milliwatt
 (1 Minute Max)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.08	- 61	6.00	-173	.0952	-174	.25	- 8
20	.06	- 81	6.13	179	.0969	178	.24	- 13
50	.07	-100	6.13	168	.0983	165	.23	- 24
100	.10	-114	6.05	154	.0997	148	.23	- 42
200	.17	-136	5.88	126	.1014	118	.26	- 74
300	.21	-158	5.75	100	.1101	90	.27	-100
400	.19	-175	5.66	72	.1149	64	.26	-117
500	.15	179	5.53	43	.1226	41	.23	-121

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RF AMPLIFIER

MODEL *TM6203*

Available as: TM6203, 4 Pin TO-8 (T4)
 TN6203, 4 Pin Surface Mount (SM3)
 FP6203, 4 Pin Flatpack (FP4)
 BX6203, Connectorized Housing (H1)

Features

- High Power: 26.5 dB Typical 1dBm Comp.
- High Third Order Intercept: +37 dBm
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.5	13 Min.
Power @ 1 dB Comp. (dBm)	26.5	25.0 Min.
Reverse Isolation (dB)	- 21	- 19 Max.
VSWR In	1.8	2.0 Max.
Out	1.25	2.0 Max.
Noise figure (dB)	< 4.0*	7.5* Max.
Power Vdc	+15	+15
mA	125	135 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

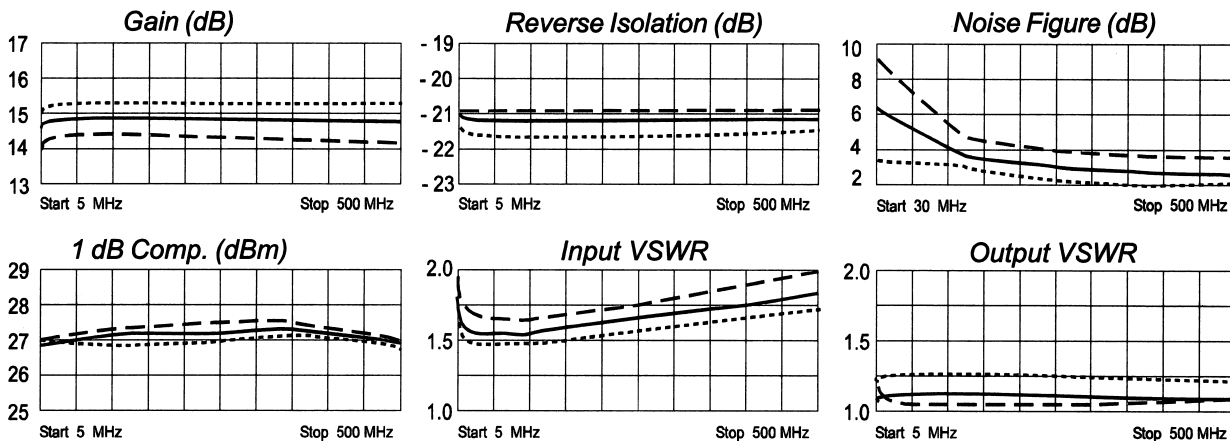
Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +37 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

*Noise Figure is Greater below 30MHz.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.27	- 34	5.40	-161	.0880	6	.06	177
50	.20	- 14	5.58	176	.0856	- 2	.09	178
100	.20	- 20	5.58	170	.0853	- 4	.09	173
200	.21	- 37	5.56	159	.0857	- 9	.09	164
300	.22	- 53	5.54	149	.0858	-13	.08	157
400	.23	- 69	5.51	138	.0858	-18	.08	151
500	.26	- 83	5.49	127	.0858	-23	.07	149

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RF AMPLIFIER

MODEL *TM6210*

Available as: TM6210, 4 Pin TO-8 (T4)
 TN6210, 4 Pin Surface Mount (SM3)
 FP6210, 4 Pin Flatpack (FP4)
 BX6210, Connectorized Housing (H1)

Features

- 5 Volt Bias; +7.5 dBm Typ. Midband Output Power
- Low Noise Figure: 1.8 dB Typ. Midband Value
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15.25	14.0 Min.
Power @ 1 dB Comp. (dBm)	+7.5	+4.5 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.75:1	2.5:1 Max.
Out	<1.75:1	2.5:1 Max.
Noise figure (dB)	<2.0	3.0 Max.
Power Vdc	+5	+5
mA	12	15 Max.

Note: Care should always be taken to effectively ground the case of each unit.

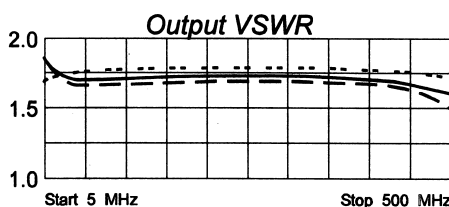
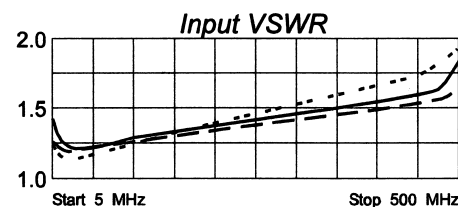
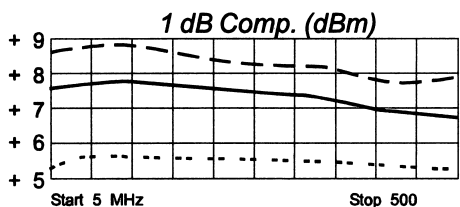
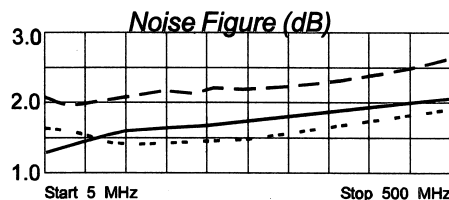
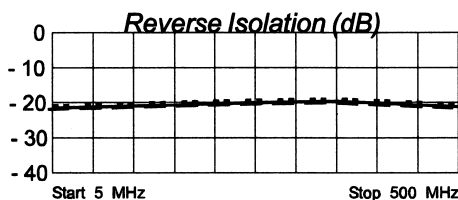
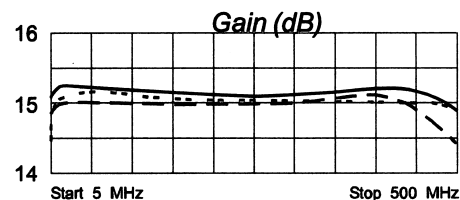
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +31 (Typ.)
 Second Order Two Tone Intercept Point +26 (Typ.)
 Third Order Two Tone Intercept Point +18 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	- 43	5.90	-176	.09	-177	.27	- 16
50	.09	- 58	5.86	165	.09	161	.25	- 29
100	.11	- 86	5.81	148	.09	141	.26	- 52
200	.16	-129	5.72	117	.10	106	.29	- 95
300	.19	-171	5.72	84	.10	75	.30	-133
400	.21	134	5.68	49	.10	46	.29	-170
500	.28	70	5.42	10	.10	19	.23	144

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RF AMPLIFIER

MODEL *TM6212*

Available as: TM6212, 4 Pin TO-8 (T4)
 TN6212, 4 Pin Surface Mount (SM3)
 FP6212, 4 Pin Flatpack (FP4)
 BX6212, Connectorized Housing (H1)
 PN6212, Reduced Size Surface Mount (SM11)

Features

- 10 MHz to 1300 MHz: 10 dB Typical Gain
- High Power: +22.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1300 MHz	10 - 1300 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	+22.5	+19.5 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	1.6:1	2.0:1 Max.
Out	1.4:1	2.0:1 Max.
Noise figure (dB)	<6.0*	8.5* Max.
Power Vdc	+15	+15
mA	92	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

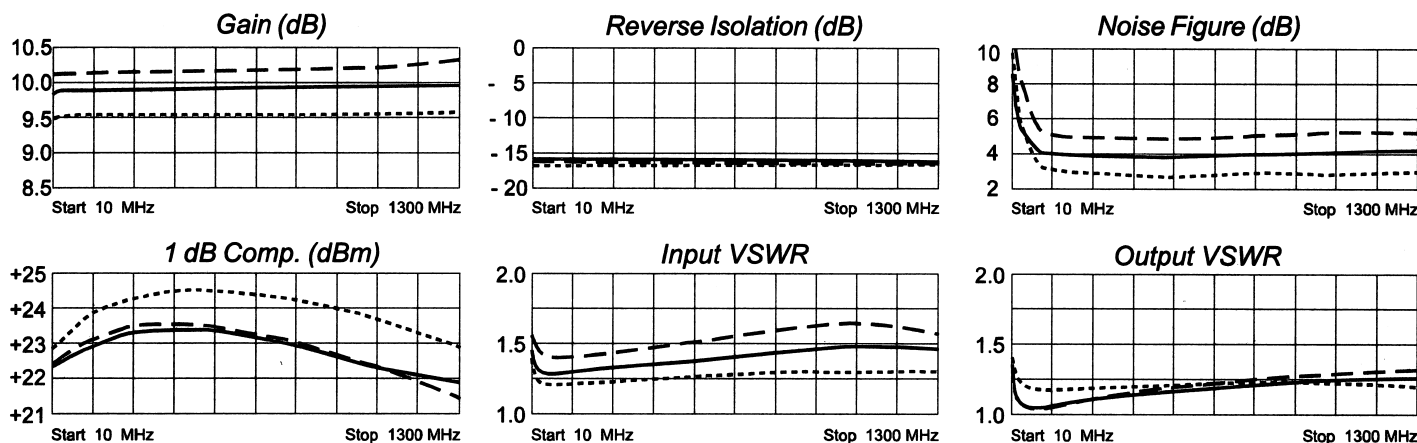
Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Noise Figure is greater for Frequencies below 30 MHz.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.19	- 37	3.18	-166	.14	11	.14	111
100	.13	- 20	3.24	175	.15	- 3	.01	158
300	.14	- 44	3.24	160	.15	-14	.03	-117
500	.16	- 65	3.24	147	.15	-23	.06	-114
700	.17	- 83	3.24	133	.14	-34	.08	-118
900	.19	- 98	3.23	119	.14	-43	.09	-118
1000	.19	-103	3.23	112	.14	-48	.10	-116
1100	.20	-110	3.26	105	.14	-53	.11	-115
1200	.20	-116	3.29	98	.14	-58	.12	-118
1300	.20	-122	3.31	91	.14	-63	.12	-120

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RF AMPLIFIER

MODEL TM6334

Available as: TM6134, 4 Pin TO-8 (T4)
 TN6134-3 4 Pin Surface Mount (SM3)
 FP6134-4, 4 Pin Flatpack (FP4)
 BX6134, Connectorized Housing (H1)
 PN6334, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +26 dBm Typ.
- High Dynamic Range: IP3 = +41 dBm Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +41 (Typ.)

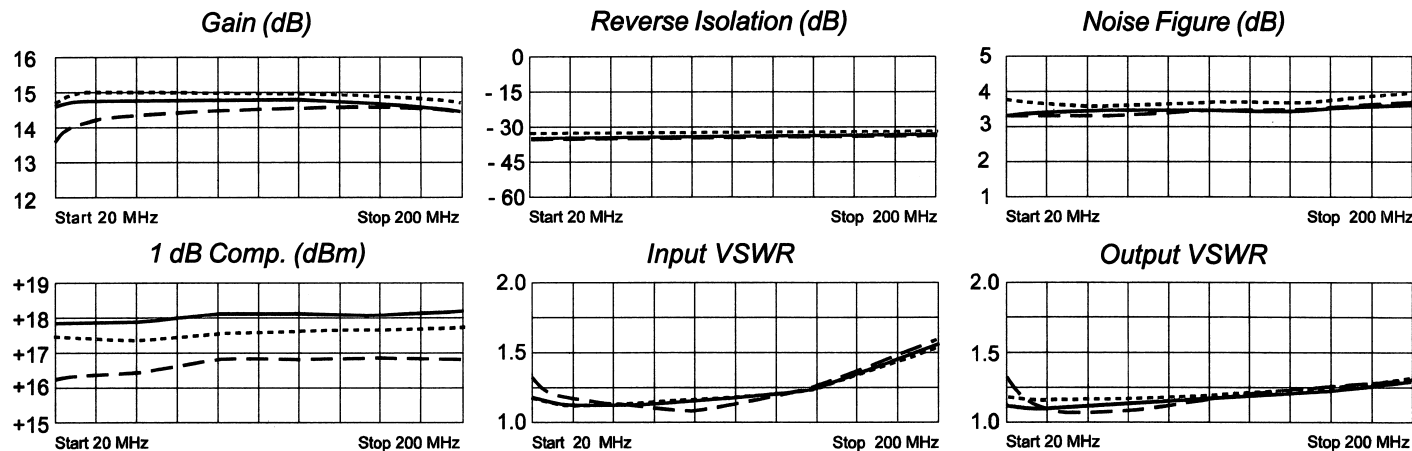
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +6 dBm
 Short Term RF Input Power 20 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2Watt
 (3 µsec Max.)

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		20-200MHz	20-200MHz
Gain (dB)		14	12.5 Min.
Power @ 1 dB Comp. (dBm)		+26	+23.5 Min.
Reverse Isolation (dB)		+20	-18 Max.
VSWR	In	<1.8:1	2.5:1 Max.
	Out	<1.8:1	2.5:1 Max.
Noise figure (dB)		3.5	5.0 Max.
Power	Vdc	+12	+12
	mA	95	105 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.14	-9	5.04	-175	.08	-177	.29	15
50	.16	-28	5.12	170	.08	166	.29	-5
100	.20	-56	5.13	153	.08	142	.28	-23
150	.25	-81	5.07	137	.09	123	.25	-43
200	.30	-101	4.98	122	.09	106	.22	-65

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RF AMPLIFIER

MODEL *TM6345*

Available as: TM6345, 4 Pin TO-8 (T4)
 TN6345, 4 Pin Surface Mount (SM3)
 FP6345, 4 Pin Flatpack (FP4)
 BX6345, Connectorized Housing (H1)

Features

- Midband Noise Figure: 2.5 dB Typical
- Midband Output Power: +17 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1100 MHz	10 - 1100 MHz
Gain (dB)	12.3	10.5 Min.
Power @ 1 dB Comp. (dBm)	+17	+15.0 Min.
Reverse Isolation (dB)	- 13.5	- 12.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	3.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	45	48 Max.

Note: Care should always be taken to effectively ground the case of each unit.

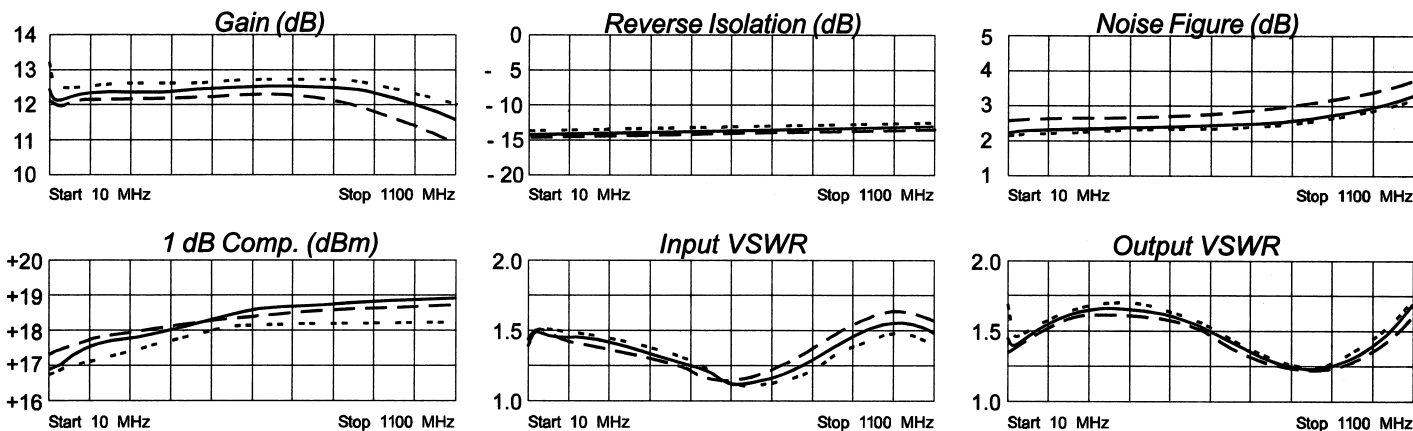
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.17	179	4.20	-166	.17	-169	.18	18
100	.18	132	4.14	162	.18	163	.20	9
200	.17	93	4.13	140	.18	144	.24	1
400	.13	26	4.14	99	.18	109	.24	- 26
600	.05	- 83	4.15	57	.20	73	.20	- 53
800	.15	144	4.10	12	.20	36	.13	-111
1100	.19	44	3.73	- 61	.21	- 23	.24	144

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RF AMPLIFIER

MODEL *TM6416*

Available as: TM6416, 4 Pin TO-8 (T4)
 TN6416, 4 Pin Surface Mount (SM3)
 FP6416, 4 Pin Flatpack (FP4)
 BX6416, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Typical
- Medium Output Power: +13.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+13.5	+12.0 Min.
Reverse Isolation (dB)	- 17.5	- 17 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	3.5	4.5 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

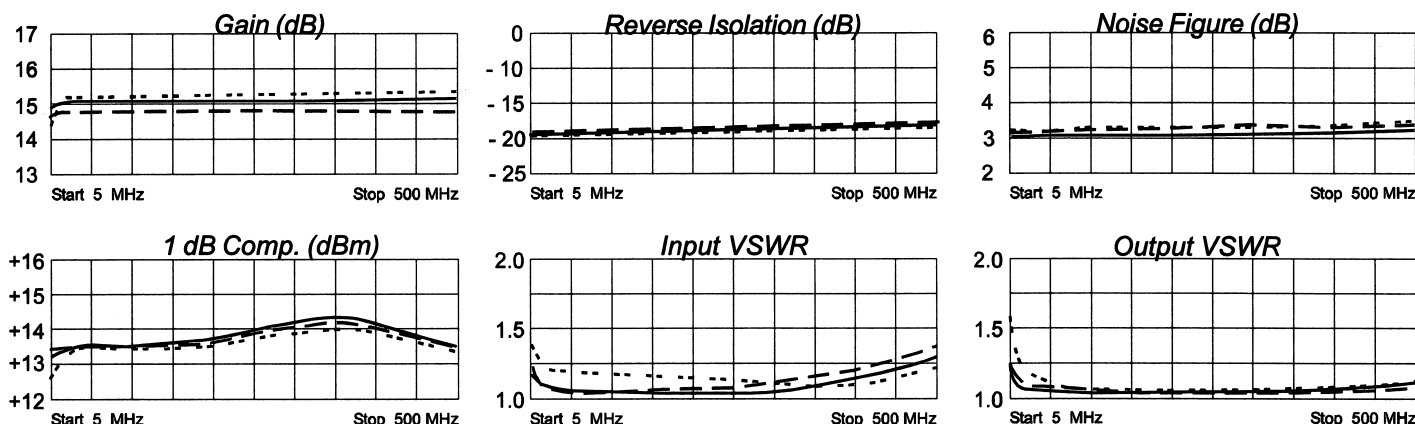
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.08	-118	5.54	-173	.11	9	.09	129
50	.05	-173	5.65	173	.11	-0	.02	154
100	.05	179	5.63	164	.12	-1	.03	175
200	.04	-176	5.65	147	.12	-3	.03	177
300	.04	-145	5.66	130	.12	-4	.04	172
400	.07	-128	5.69	113	.13	-8	.04	145
500	.12	-127	5.73	96	.14	-12	.06	111

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RF AMPLIFIER

MODEL *TM6421*

Available as: TM6421, 4 Pin TO-8 (T4)
 TN6421, 4 Pin Surface Mount (SM3)
 FP6421, 4 Pin Flatpack (FP4)
 BX6421, Connectorized Housing (H1)

Features

- High Gain: 30 dB Typ.
- Medium Output Power: +9 dBm Typ.
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 400 MHz	5 - 400 MHz
Gain (dB)	30	27 Min.
Power @ 1 dB Comp. (dBm)	+9	+7 Min.
Reverse Isolation (dB)	-36	-33 Max.
VSWR In	1.35:1	2.0:1 Max.
Out	1.65:1	2.0:1 Max.
Noise figure (dB)	3.5	6.0 Max.
Power Vdc	+15	+15
mA	37	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

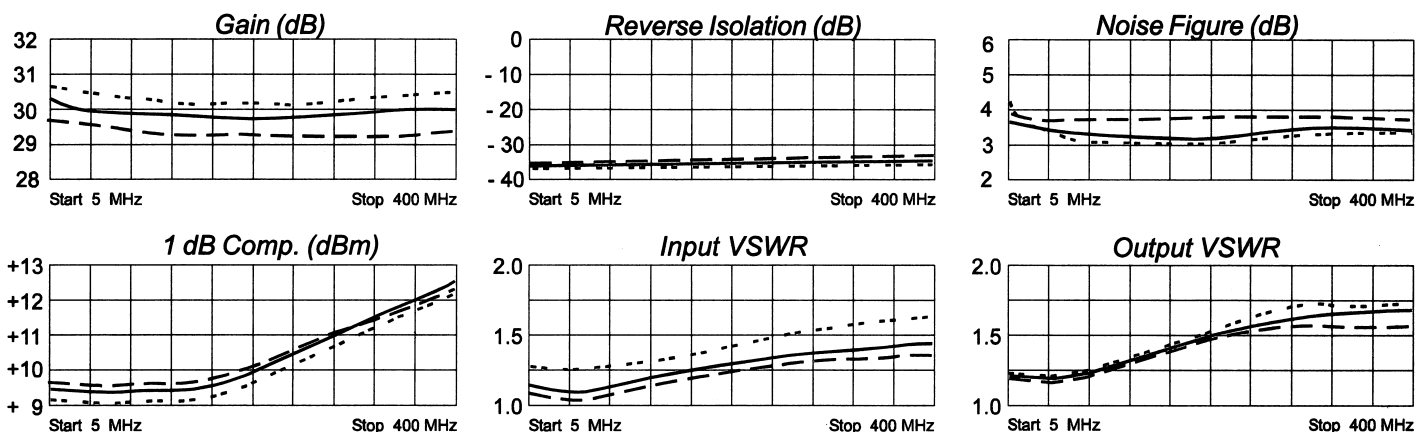
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +36 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.06	-148	32.67	3	.01	7	.07	-162
50	.06	163	31.75	-21	.01	2	.08	-165
100	.07	147	31.43	-41	.01	6	.11	-162
200	.11	112	31.15	-82	.01	14	.17	-176
300	.15	85	31.19	-123	.01	13	.23	163
400	.19	61	31.59	-166	.02	-3	.26	140

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RF AMPLIFIER

MODEL *TM6440*

Available as: TM6440, 4 Pin TO-8 (T4)
 TN6440, 4 Pin Surface Mount (SM3)
 FP6440, 4 Pin Flatpack (FP4)
 BX6440, Connectorized Housing (H1)

Features

- Low Current Drain: 15mA with +9 dBm Output
- Medium Gain: +13 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 400 MHz
Gain (dB)	13.0	12.0 Min.
Power @ 1 dB Comp. (dBm)	+9.0	+7.5 Min.
Reverse Isolation (dB)	- 18.5	- 17.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	3.6	5.0 Max.
Power Vdc	+15	+15
mA	15	17 Max.

Note: Care should always be taken to effectively ground the case of each unit.

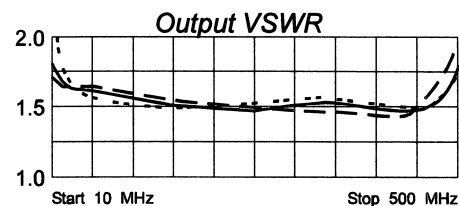
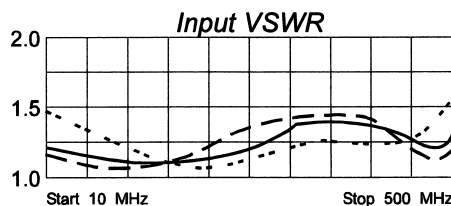
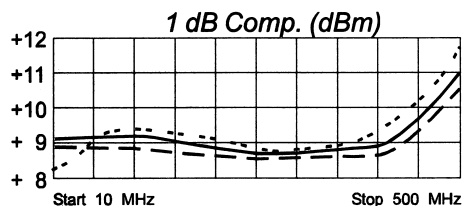
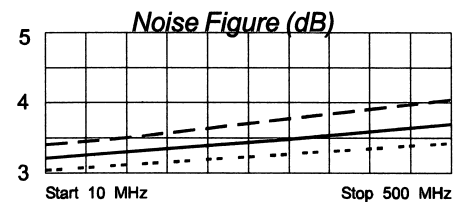
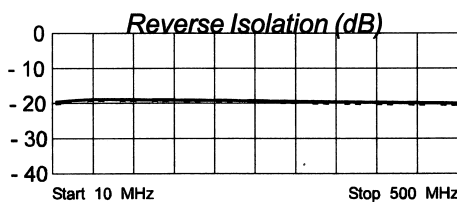
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	Phase Deg	Mag	Phase Deg	Mag	Phase Deg	Mag	Phase Deg
	S11		S21		S12		S22	
10	.10	-125	4.62	-175	.11	7	.29	165
50	.08	172	4.78	165	.12	- 8	.23	176
100	.05	136	4.78	147	.12	- 20	.22	179
200	.04	- 4	4.74	112	.11	- 42	.20	-168
300	.12	- 76	4.76	76	.11	- 66	.20	-154
400	.15	-130	4.91	36	.11	- 93	.16	-135
500	.11	95	4.91	- 17	.10	-131	.30	- 82

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RF AMPLIFIER

MODEL *TM6441*

Available as: TM6441, 4 Pin TO-8 (T4)
 TN6441, 4 Pin Surface Mount (SM3)
 FP6441, 4 Pin Flatpack (FP4)
 BX6441, Connectorized Housing (H1)

Features

- Medium Output Power: +16 dBm Typical
- High Dynamic Range: 85 dB Typical*
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 400 MHz	20 - 400 MHz
Gain (dB)	14.5	13.0 Min.
Power @ 1 dB Comp. (dBm)	+16.0	+15.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	3.5	5.0 Max.
Power Vdc	+15	+15
mA	32	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

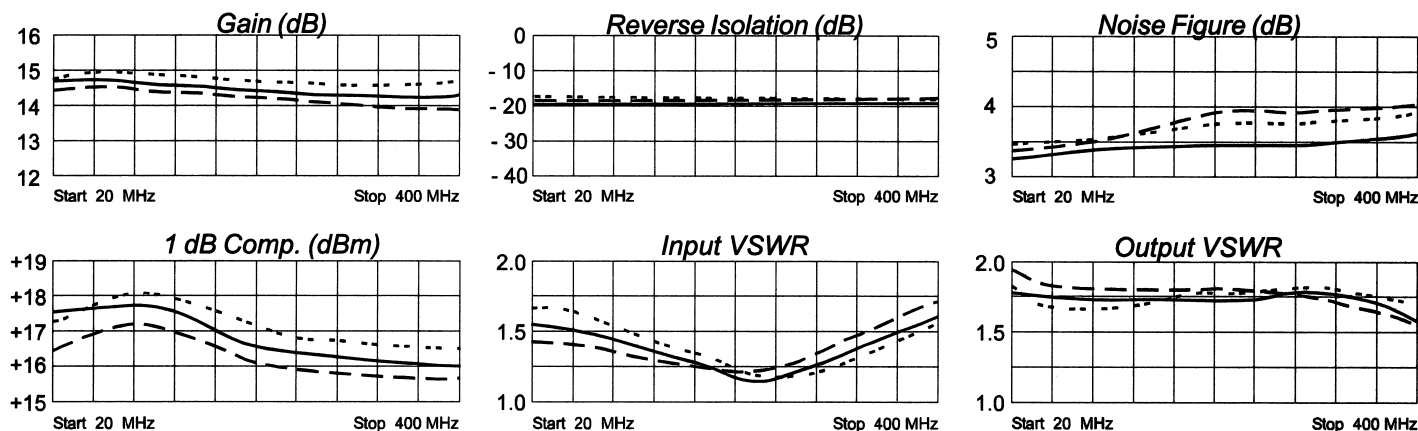
Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Spurious-free Dynamic Range Calculated for 1 MHz Bandwidth

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-154	5.38	-176	.10	7	.30	170
20	.22	-169	5.46	177	.10	2	.28	173
50	.21	179	5.47	164	.10	- 6	.27	178
100	.18	168	5.43	146	.10	- 15	.27	-180
200	.09	176	5.30	110	.10	- 31	.29	179
300	.13	-126	5.17	74	.11	- 49	.29	166
400	.24	-136	5.18	34	.11	- 72	.24	124
500	.20	-160	4.98	- 18	.10	-108	.35	7

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RF AMPLIFIER

MODEL *TM6442*

Available as: TM6442, 4 Pin TO-8 (T4)
 TN6442, 4 Pin Surface Mount (SM3)
 FP6442, 4 Pin Flatpack (FP4)
 BX6442, Connectorized Housing (H1)

Features

- High Output Power: +22 dBm Typical
- High Dynamic Range IP3= 37 dBm
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 400 MHz	20 - 400 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+22	+19.0 Min.
Reverse Isolation (dB)	- 19	- 17 Max.
VSWR In	1.15:1	2.0:1 Max.
Out	1.25:1	2.0:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+15	+15
mA	62	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

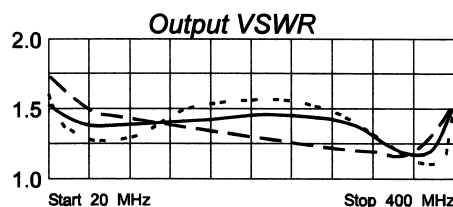
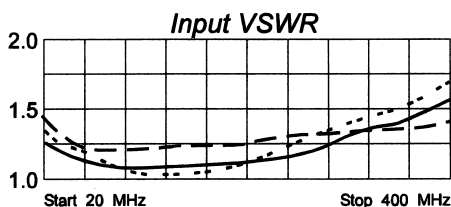
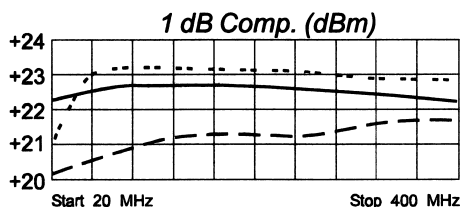
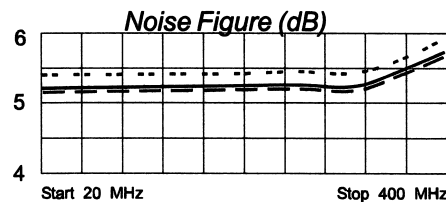
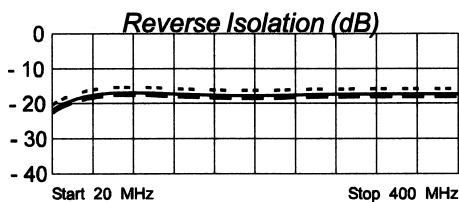
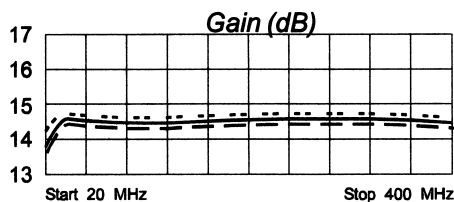
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +57 (Typ.)
 Second Order Two Tone Intercept Point +51 (Typ.)
 Third Order Two Tone Intercept Point +37 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 μsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C ····· -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.13	-115	5.08	-173	.10	10	.23	153
50	.08	-168	5.23	161	.10	- 6	.16	177
100	.06	-170	5.19	138	.10	- 18	.16	-171
200	.07	-123	5.07	93	.11	- 39	.18	-169
300	.15	-155	5.04	45	.11	- 66	.11	159
400	.22	97	4.82	- 16	.12	-108	.12	- 14

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RF AMPLIFIER

MODEL *TM6443*

Available as: TM6443, 4 Pin TO-8 (T4)
 TN6443, 4 Pin Surface Mount (SM3)
 FP6443, 4 Pin Flatpack (FP4)
 BX6443, Connectorized Housing (H1)

Features

- Low Power Drain: 10 mA @ +5 Volts Typical
- Output Power: +6.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	13.2	12.0 Min.
Power @ 1 dB Comp. (dBm)	+6.5	+5.0 Min.
Reverse Isolation (dB)	- 17	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.5	5.0 Max.
Power Vdc	+5	+5
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

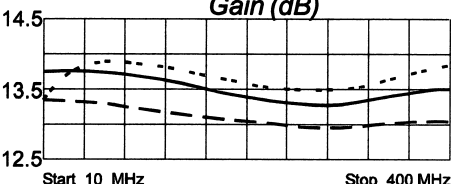
Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +27 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

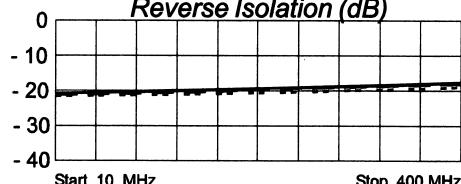
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

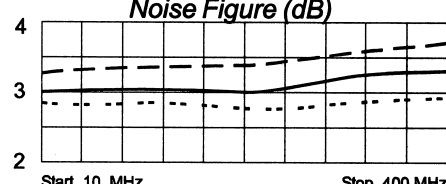
Gain (dB)



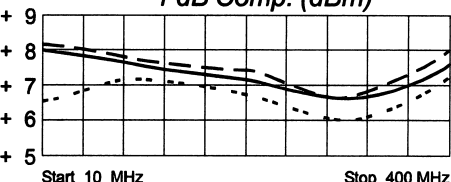
Reverse Isolation (dB)



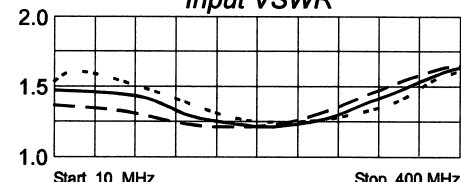
Noise Figure (dB)



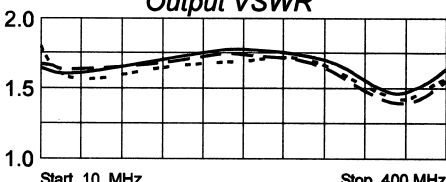
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.15	-158	4.86	-179	.11	3	.22	172
50	.14	169	4.89	161	.11	- 9	.21	-175
100	.11	154	4.84	141	.12	- 19	.24	-169
200	.03	-177	4.71	100	.12	- 39	.29	-176
300	.12	-137	4.72	58	.12	- 61	.28	154
400	.16	157	4.87	6	.13	- 97	.27	54
500	.25	11	3.52	- 65	.10	-150	.69	- 52

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RF AMPLIFIER

MODEL *TM6444*

Available as: TM6444, 4 Pin TO-8 (T4)
 TN6444, 4 Pin Surface Mount (SM3)
 FP6444, 4 Pin Flatpack (FP4)
 BX6444, Connectorized Housing (H1)

Features

- Medium Power at 1dB Compression: +11 dBm
- High Efficiency: 15 mA at +5V
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	13	12.0 Min.
Power @ 1 dB Comp. (dBm)	+11	+9.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	1.50:1	2.0:1 Max.
Out	1.50:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+5	+5
mA	15	17 Max.

Note: Care should always be taken to effectively ground the case of each unit.

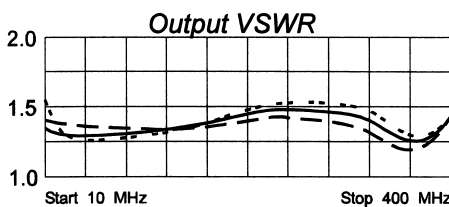
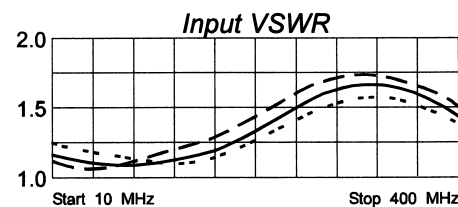
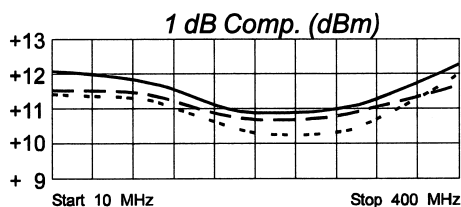
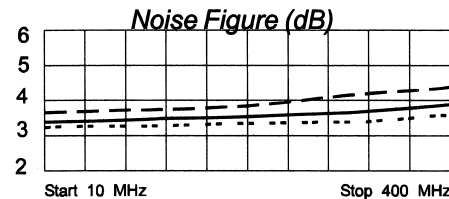
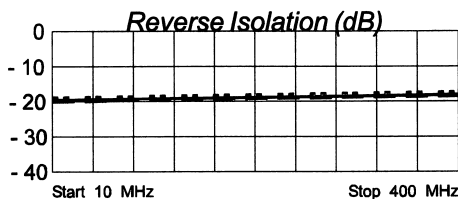
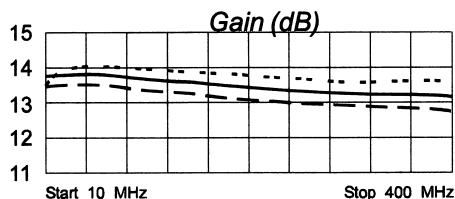
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +37 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.19	- 87	4.60	-164	.10	16	.33	154
10	.11	-105	4.75	-175	.10	7	.26	158
50	.06	-139	4.87	160	.11	- 10	.19	165
100	.05	-125	4.85	137	.11	- 23	.15	165
200	.14	- 92	4.72	91	.11	- 50	.11	-161
300	.23	-110	4.55	44	.11	- 80	.14	-159
400	.18	-110	4.41	- 13	.11	-122	.09	23
500	.50	- 82	2.98	- 87	.07	179	.67	- 59

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RF AMPLIFIER

MODEL *TM6457*

Available as: TM6457, 4 Pin TO-8 (T4)
 TN6457, 4 Pin Surface Mount (SM3)
 FP6457, 4 Pin Flatpack (FP4)
 BX6457, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Low Noise Figure: <2.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 400 MHz	5 - 400 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+7.5 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.7:1	2.0:1 Max.
Noise figure (dB)	<2.0	3.0 Max.
Power Vdc	+5	+5
mA	15.5	18 Max.

Note: Care should always be taken to effectively ground the case of each unit.

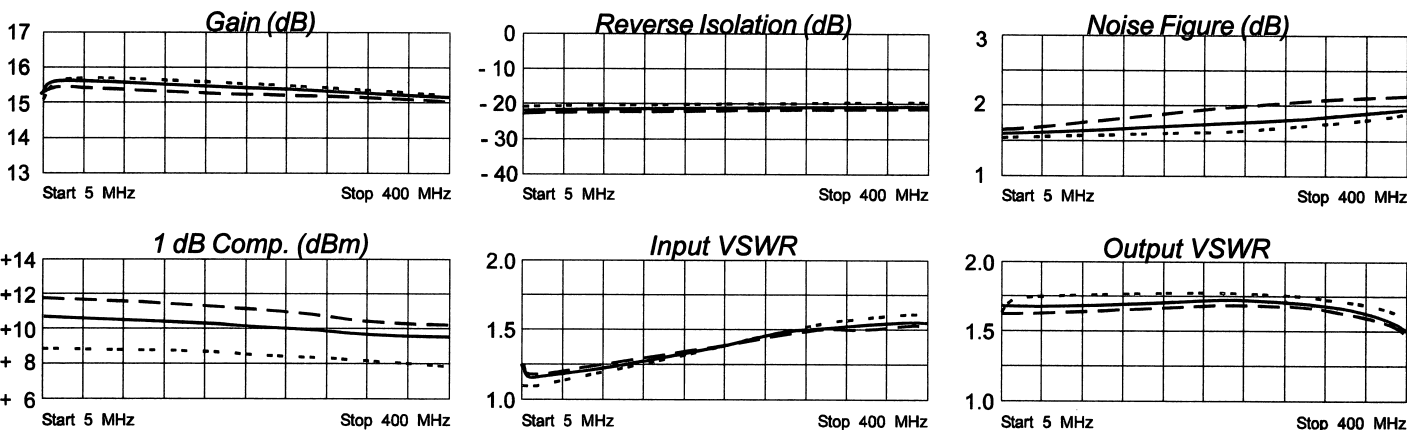
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.12	- 53	5.89	-166	.09	-166	.27	- 16
50	.08	- 62	6.10	167	.10	166	.25	- 20
100	.11	- 88	6.05	152	.09	152	.25	- 34
200	.19	-123	6.01	124	.09	123	.25	- 63
300	.24	-154	6.08	94	.09	94	.25	- 89
400	.28	171	6.12	62	.09	67	.21	-111
500	.30	123	5.93	25	.08	37	.12	-122

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RF AMPLIFIER

MODEL *TM6487*

Available as: TM6487, 4 Pin TO-8 (T4)
 TN6487, 4 Pin Surface Mount (SM3)
 FP6487, 4 Pin Flatpack (FP4)
 BX6487, Connectorized Housing (H1)

Features

- High Output at 1dB Compression: +17.5 dBm
- High Efficiency: 33 mA at 15V
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	15.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+17.5	+15.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	1.50:1	2.0:1* Max.
Out	1.70:1	2.0:1 Max.
Noise figure (dB)	3.2	5.0 Max.
Power Vdc	+15	+15
mA	33	37 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

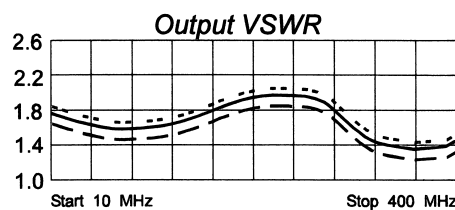
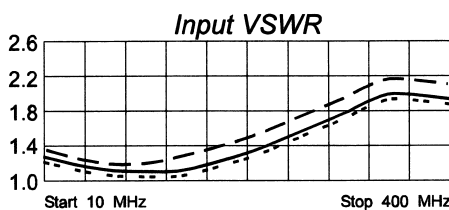
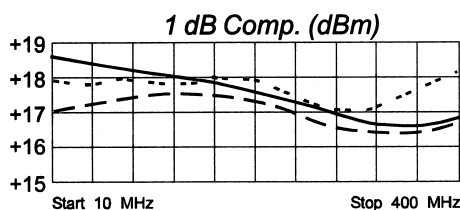
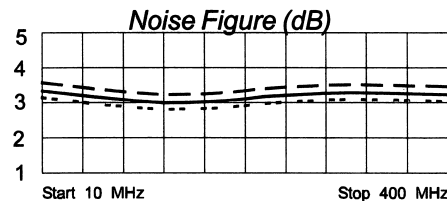
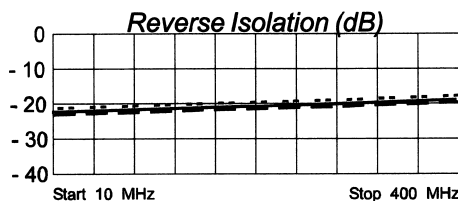
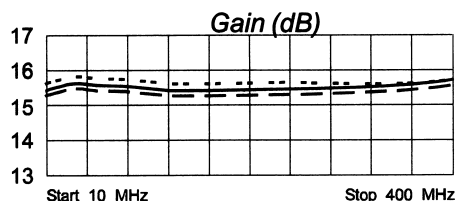
Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* 2.5:1 from 300 to 400 MHz

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.15	-136	6.09	-175	.09	8	.28	166
50	.13	174	6.25	161	.09	- 7	.23	-180
100	.09	155	6.17	139	.09	- 18	.24	-172
200	.02	- 79	5.95	97	.10	- 39	.26	-166
300	.15	-111	5.93	54	.10	- 61	.24	-170
400	.20	178	5.91	4	.11	- 93	.05	-156
500	.38	39	4.77	- 64	.10	-146	.55	- 69

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RF AMPLIFIER

MODEL *TM6501*

Available as: TM6501, 4 Pin TO-8 (T4)
 TN6501, 4 Pin Surface Mount (SM3)
 FP6501, 4 Pin Flatpack (FP4)
 BX6501, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- High Gain: 16.5 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.5 Min.
Power @ 1 dB Comp. (dBm)	+3	+1.0 Min.
Reverse Isolation (dB)	-20	-18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

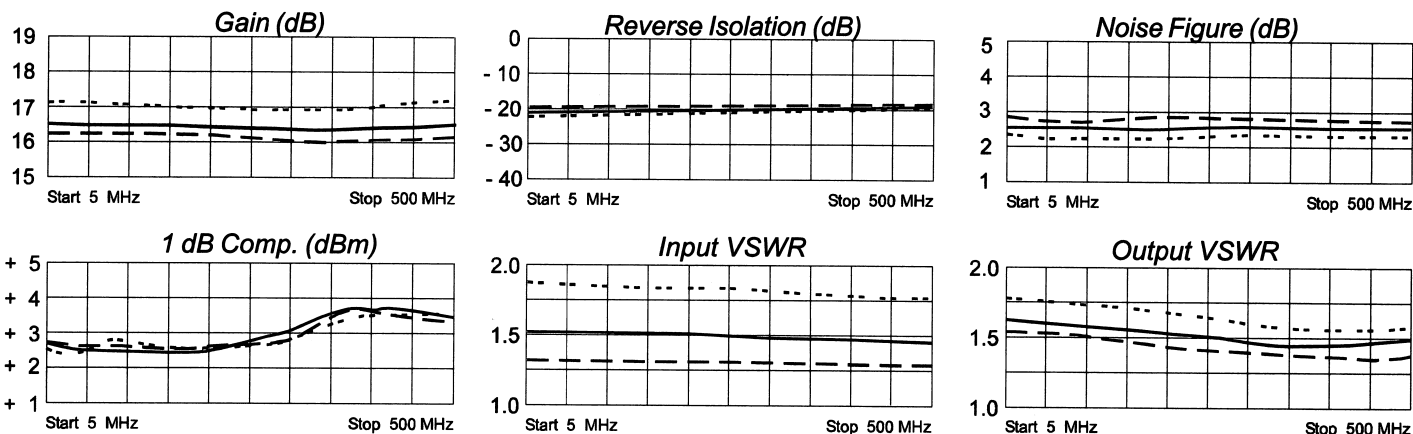
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +23 (Typ.)
 Second Order Two Tone Intercept Point +17 (Typ.)
 Third Order Two Tone Intercept Point +15 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-175	6.85	-177	.09	5	.21	-173
50	.20	172	6.81	171	.09	1	.20	171
100	.20	163	6.81	161	.09	0	.20	162
200	.20	146	6.74	141	.10	-1	.19	145
300	.19	131	6.69	123	.10	-2	.17	132
400	.19	116	6.75	104	.10	-5	.17	124
500	.19	103	6.88	84	.11	-7	.18	119
600	.19	92	7.16	62	.11	-11	.23	109

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RF AMPLIFIER

MODEL *TM6502*

Available as: TM6502, 4 Pin TO-8 (T4)
 TN6502, 4 Pin Surface Mount (SM3)
 BX6502, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Power @ 1 dB: 19 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	10 - 500	10 - 500
Gain (dB)	20	+ 19 Min.
Power @ 1 dB Comp. (dBm)	19.5	+18.5 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	1.4:1	1.75:1 Max.
Out	1.3:1	1.75:1 Max.
Noise figure (dB)	4	5 Max.
Power Vdc	15	15
mA	80	85 Max.

Note: Care should always be taken to effectively ground the case of each unit.

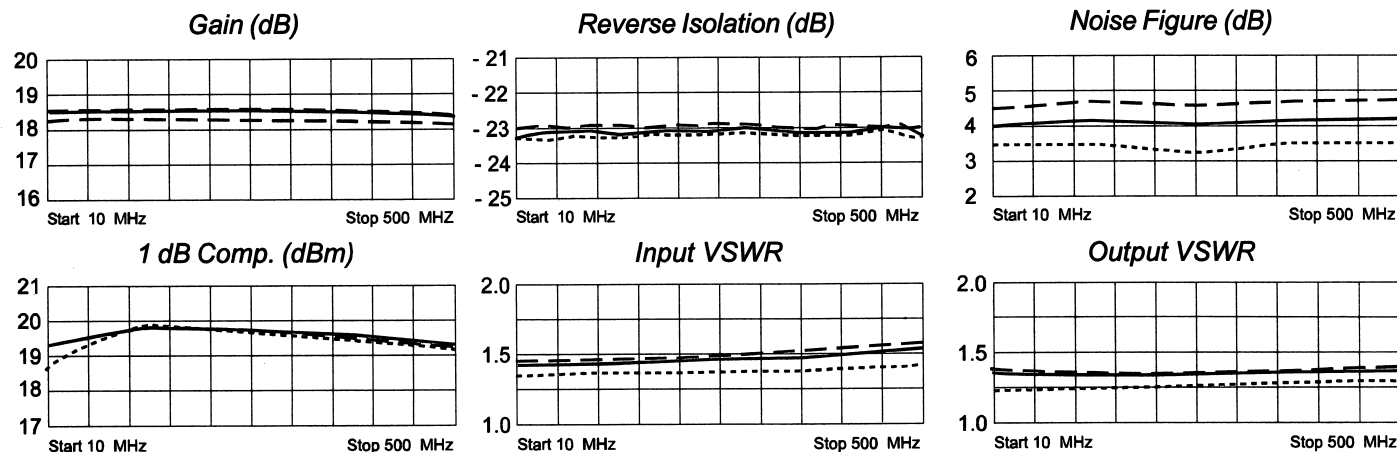
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

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RF AMPLIFIER MODEL *TM6503*

Available as: TM6503, 4 Pin TO-8 (T4)
TN6503, 4 Pin Surface Mount (SM3)
FP6503, 4 Pin Flatpack (FP4)
BX6503, Connectorized Housing (H1)

Features

- Low Noise Figure: 3.5 dB Typical
- High Gain: +16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.5 Min.
Power @ 1 dB Comp. (dBm)	+1.5	0.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.5	4.5 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

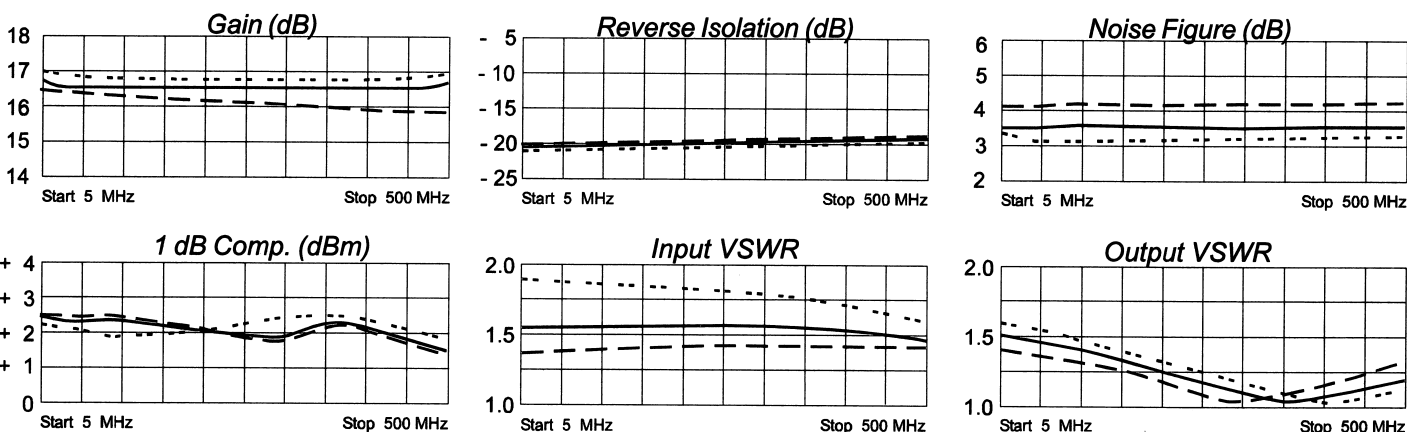
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +22 (Typ.)
Second Order Two Tone Intercept Point +16 (Typ.)
Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.23	-177	6.84	-178	.09	4	.21	-176
50	.23	165	6.76	169	.09	-1	.19	171
100	.23	149	6.73	158	.09	-1	.18	162
200	.23	120	6.71	136	.10	-3	.12	147
300	.22	90	6.67	114	.10	-8	.06	147
400	.21	60	6.69	92	.11	-13	.03	-118
500	.19	24	6.78	69	.11	-19	.08	-114

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RF AMPLIFIER

MODEL *TM6505*

Available as: TM6505, 4 Pin TO-8 (T4)
 TN6505, 4 Pin Surface Mount (SM3)
 FP6505, 4 Pin Flatpack (FP4)
 BX6505, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Typical
- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+8.5 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	4.0	5.0 Max.
Power Vdc	+15	+15
mA	24	27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

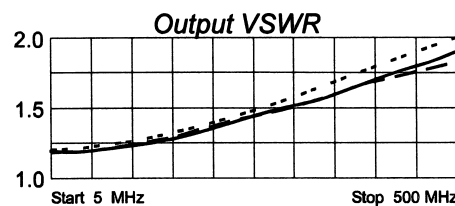
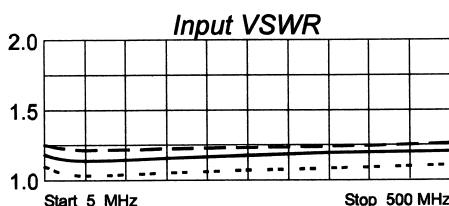
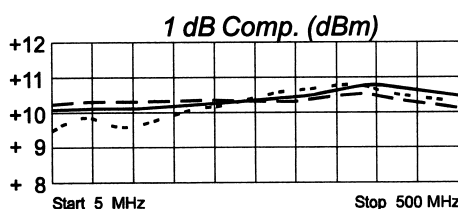
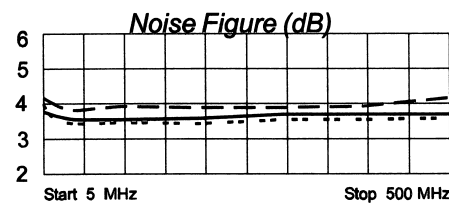
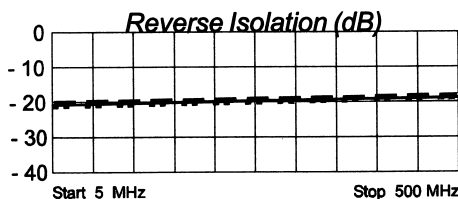
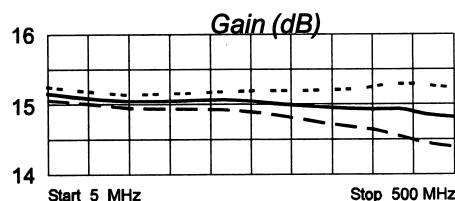
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.08	-3	5.80	-178	.10	2	.05	1.14
50	.07	-7	5.70	170	.10	-0	.05	1.16
100	.07	-10	5.69	159	.10	-2	.07	1.16
200	.08	-19	5.66	139	.10	-1	.11	1.13
300	.08	-38	5.63	118	.11	-3	.17	1.10
400	.08	-63	5.56	97	.11	-7	.24	1.05
500	.08	-92	5.44	74	.12	-10	.30	1.01

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RF AMPLIFIER

MODEL *TM6507*

Available as: TM6507, 4 Pin TO-8 (T4)
TN6507, 4 Pin Surface Mount (SM3)
FP6507, 4 Pin Flatpack (FP4)
BX6507, Connectorized Housing (H1)
PN6507, Reduced Size Surface Mount (SM11)

Features

- Gain: 15.5 dB Typical
- High Output Power: +24 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	15.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+24	+20.0 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.7:1	2.0:1 Max.
Noise figure (dB)	4.0*	6.0* Max.
Power Vdc	+15	+15
mA	110	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

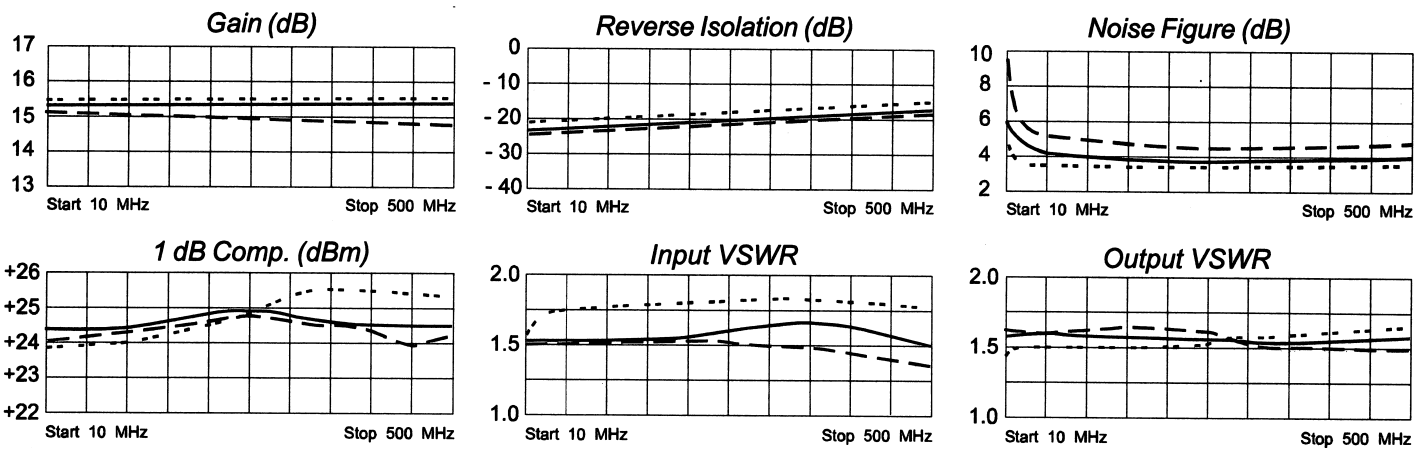
Second Order Harmonic Intercept Point +46 (Typ.)
Second Order Two Tone Intercept Point +40 (Typ.)
Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

* Noise Figure may be greater for frequencies below 20 MHz.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.16	-136	5.94	-171	.10	10	.20	144
50	.14	177	6.13	172	.10	1	.12	158
100	.14	159	6.12	161	.10	- 1	.12	155
200	.14	134	6.04	139	.10	- 4	.11	141
300	.13	117	5.96	119	.11	- 8	.11	119
400	.12	108	5.88	98	.12	-11	.10	103
500	.12	114	5.79	77	.12	-18	.11	85



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Rev. A 10/26/01

RF AMPLIFIER

MODEL *TM6509PM*

Available as: TM6509PM, 4 Pin TO-8 (T4)
 TN6509PM, 4 Pin Surface Mount (SM3)
 FP6509PM, 4 Pin Flatpack (FP4)
 BX6509PM, Connectorized Housing (H1)

Features

- Superior Phase Noise Performance
- High Output Power: +23 dBm Typical
- High Dynamic Range: IP3 = +36 dBm Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.5	13.0 Min.
Power @ 1 dB Comp. (dBm)	+23	+20 Min.
Reverse Isolation (dB)	- 18	- 15 Max.
VSWR In	<1.4:1	2.0:1 Max.
Out	<1.2:1	2.0:1 Max.
Noise figure (dB)	4.6	6.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

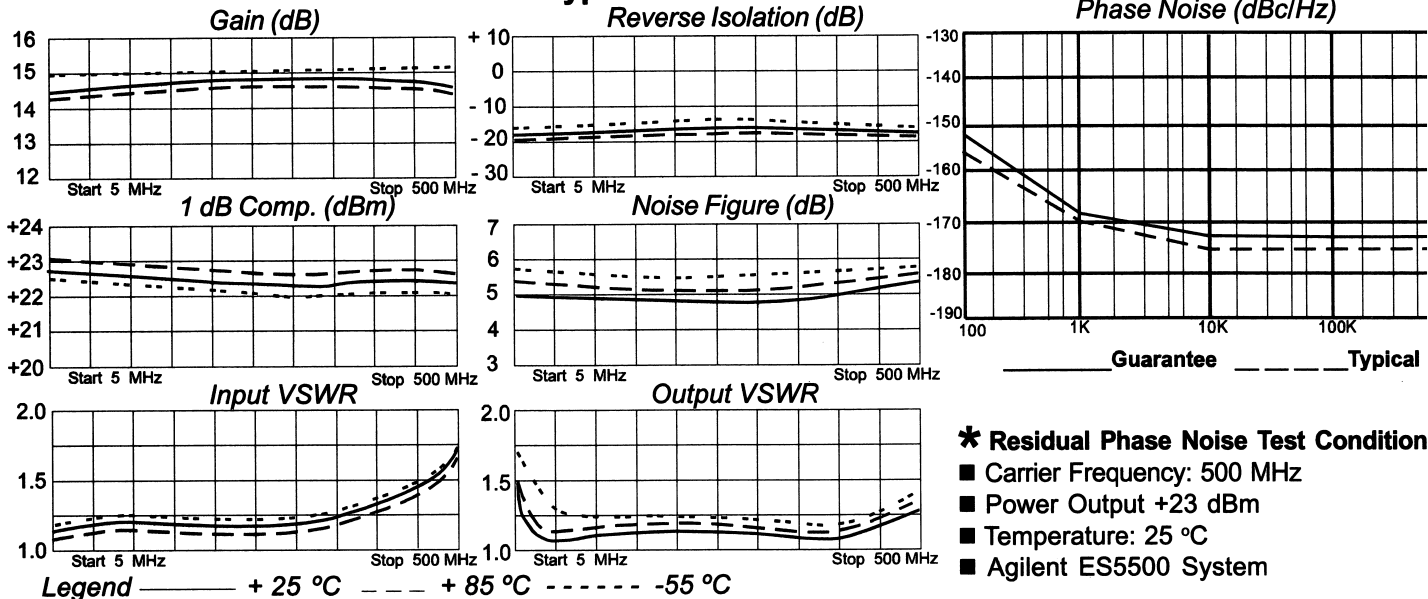
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 13 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 mW (1 Minute Max.)
 Maximum Peak Power 0.5 Watt (3 µsec Max.)

Guaranteed Phase Noise Performance (dBc/Hz) *

Frequency	Typical	Guarantee (min.)
100 Hz	-156	-152
1 KHz	-170	-168
10 KHz	-175	-172
100 KHz	-175	-172
1 MHz	-175	-172

Typical Performance Data



* Residual Phase Noise Test Condition

- Carrier Frequency: 500 MHz
- Power Output +23 dBm
- Temperature: 25 °C
- Agilent ES5500 System

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.23	-41	5.86	-163	.08	19	.27	86
100	.13	80	5.46	159	.11	3	.05	23
200	.40	24	5.51	137	.12	3	.04	23
300	.58	-31	5.50	114	.14	2	.04	45
400	.10	-91	5.53	90	.15	-1	.08	71
500	.20	-137	5.45	64	.17	-9	.17	66

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03/11/03

RF AMPLIFIER

MODEL *TM6510*

Available as: TM6510, 4 Pin TO-8 (T4)
 TN6510, 4 Pin Surface Mount (SM3)
 FP6510, 4 Pin Flatpack (FP4)
 BX6510, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- High Gain: 16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.5 Min.
Power @ 1 dB Comp. (dBm)	+3	+1.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

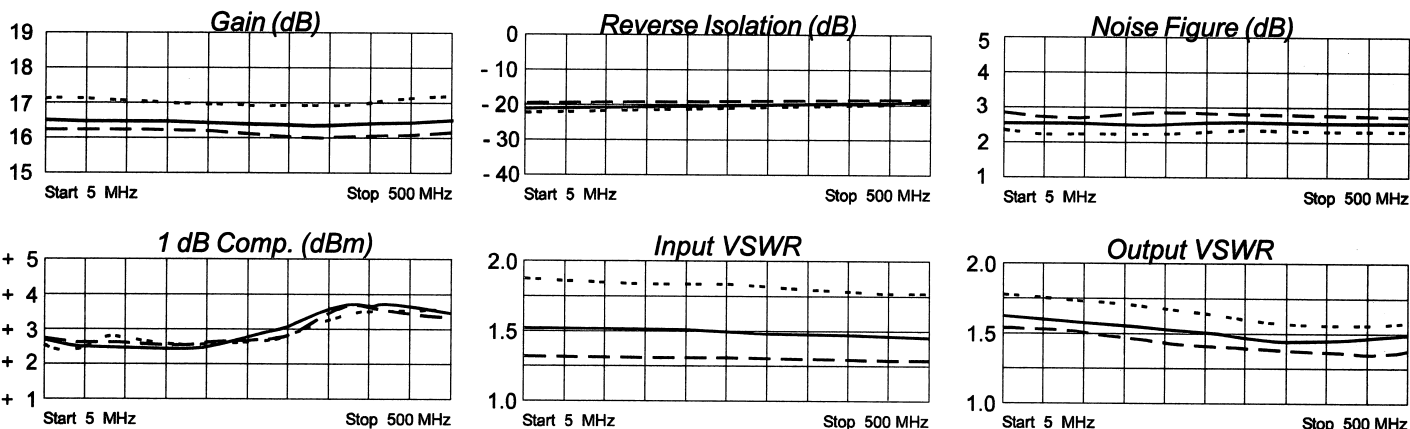
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +23 (Typ.)
 Second Order Two Tone Intercept Point +17 (Typ.)
 Third Order Two Tone Intercept Point +15 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-175	6.85	-177	.09	5	.21	-173
50	.20	172	6.81	171	.09	1	.20	171
100	.20	163	6.81	161	.09	0	.20	162
200	.20	146	6.74	141	.10	-1	.19	145
300	.19	131	6.69	123	.10	-2	.17	132
400	.19	116	6.75	104	.10	-5	.17	124
500	.19	103	6.88	84	.11	-7	.18	119
600	.19	92	7.16	62	.11	-11	.23	109

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RF AMPLIFIER

MODEL *TM6511*

Available as: TM6511, 4 Pin TO-8 (T4)
 TN6511, 4 Pin Surface Mount (SM3)
 FP6511, 4 Pin Flatpack (FP4)
 BX6511, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- High Gain: 16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.5 Min.
Power @ 1 dB Comp. (dBm)	+2	+1.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.0 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

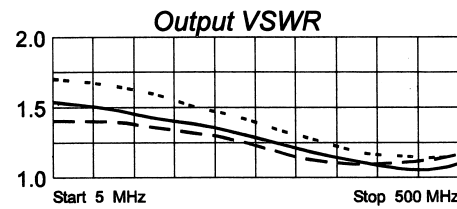
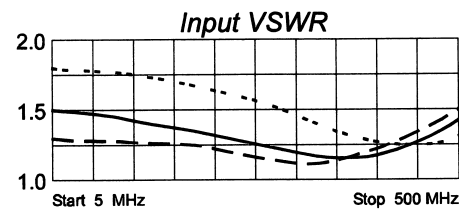
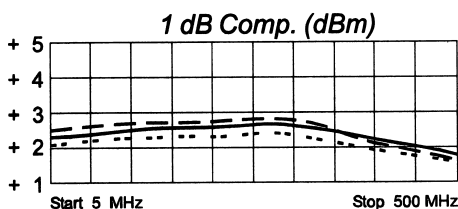
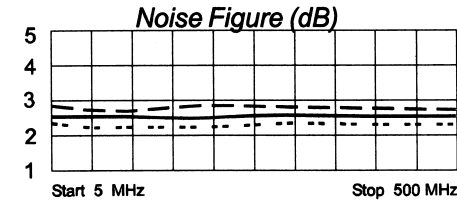
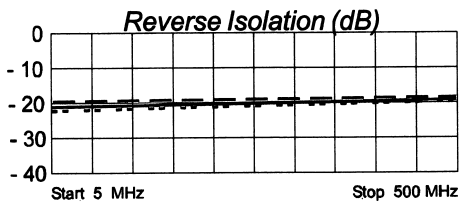
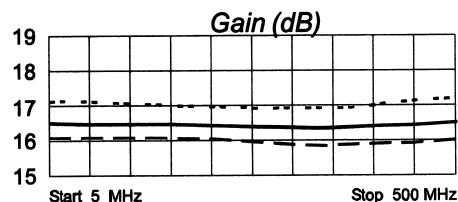
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +21 (Typ.)
 Second Order Two Tone Intercept Point +16 (Typ.)
 Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-175	6.85	-177	.09	5	.21	-173
50	.20	172	6.81	171	.09	1	.20	171
100	.20	163	6.81	161	.09	0	.20	162
200	.20	146	6.74	141	.10	-1	.19	145
300	.19	131	6.69	123	.10	-2	.17	132
400	.19	116	6.75	104	.10	-5	.17	124
500	.19	103	6.88	84	.11	-7	.18	119
600	.19	92	7.16	62	.11	-11	.23	109

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RF AMPLIFIER

MODEL *TM6512*

Available as: TM6512, 4 Pin TO-8 (T4)
 TN6512, 4 Pin Surface Mount (SM3)
 FP6512, 4 Pin Flatpack (FP4)
 BX6512, Connectorized Housing (H1)

Features

- High Gain: 21 dB Typical
- Low Noise Figure: 2.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	21	19.0 Min.
Power @ 1 dB Comp. (dBm)	+10.0	+8.0 Min.
Reverse Isolation (dB)	- 22	- 20 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	23	26 Max.

Note: Care should always be taken to effectively ground the case of each unit.

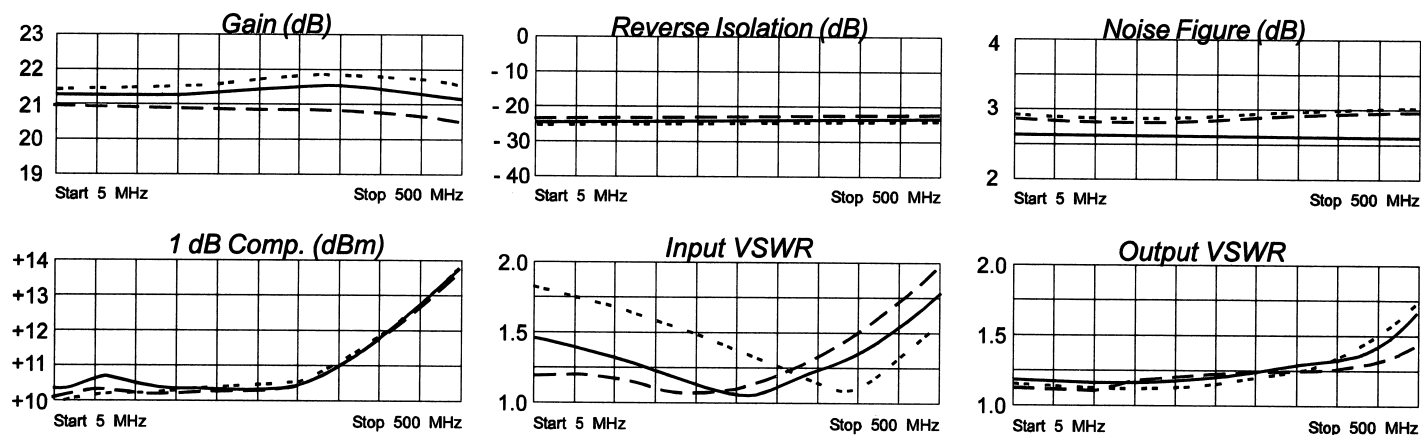
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +27 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.17	-152	11.53	-173	.06	8	.13	142
10	.17	-166	11.69	-178	.06	6	.09	147
50	.16	174	11.77	168	.06	- 0	.06	154
100	.14	164	11.78	154	.06	- 1	.05	138
200	.08	154	11.83	127	.06	- 2	.02	92
300	.04	-139	11.92	99	.06	- 5	.03	- 9
400	.16	-112	11.99	67	.07	- 9	.05	4
500	.32	-133	11.51	31	.08	-18	.19	6

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RF AMPLIFIER

MODEL *TM6513*

Available as: TM6513, 4 Pin TO-8 (T4)
 TN6513, 4 Pin Surface Mount (SM3)
 FP6513, 4 Pin Flatpack (FP4)
 BX6513, Connectorized Housing (H1)

Features

- 24 Volt Operation
- Medium Output Power: +16.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	17	15.5 Min.
Power @ 1 dB Comp. (dBm)	+16.5	+15.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	3.75	5.0 Max.
Power Vdc	+24	+24
mA	50	53 Max.

Note: Care should always be taken to effectively ground the case of each unit.

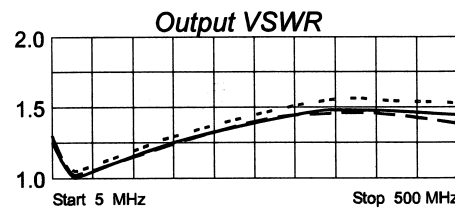
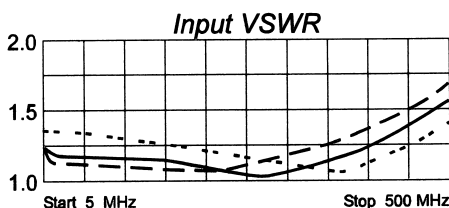
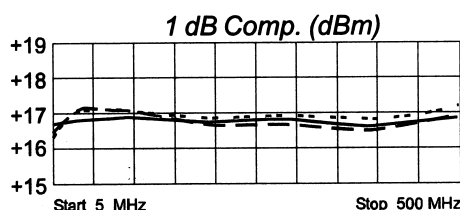
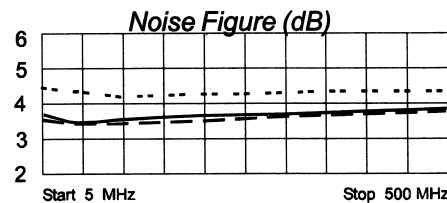
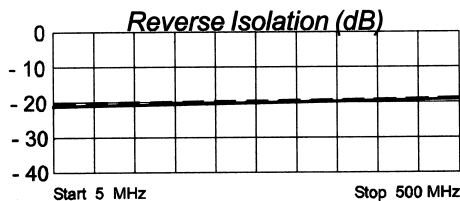
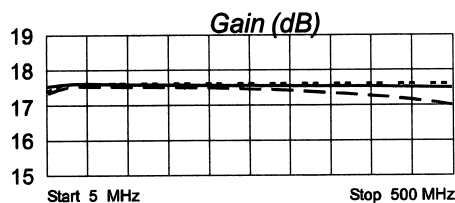
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +47 (Typ.)
 Second Order Two Tone Intercept Point +41 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 26 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.10	-126	7.62	-172	.08	10	.10	113
50	.08	178	7.74	169	.08	-0	.03	-98
100	.07	166	7.71	156	.08	-3	.07	-106
200	.04	154	7.63	132	.08	-5	.14	-126
300	.02	-124	7.59	107	.09	-8	.19	-150
400	.10	-108	7.54	81	.10	-13	.20	-178
500	.21	-128	7.42	54	.11	-20	.17	135

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RF AMPLIFIER

MODEL *TM6514*

Available as: TM6514, 4 Pin TO-8 (T4)
 TN6514, 4 Pin Surface Mount (SM3)
 FP6514, 4 Pin Flatpack (FP4)
 BX6514, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.0 dB Typical
- Low Supply Current: 8 mA Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	30-200 MHz	30 -200 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	> -2	-3.0 Min.
Reverse Isolation (dB)	- 20	- 18.5 Max.
VSWR In	<1.4:1	2.0:1 Max.
Out	<1.2:1	2.0:1 Max.
Noise figure (dB)	<2.0	3.0 Max.
Power Vdc	+15	+15
mA	8	9 Max.

Note: Care should always be taken to effectively ground the case of each unit.

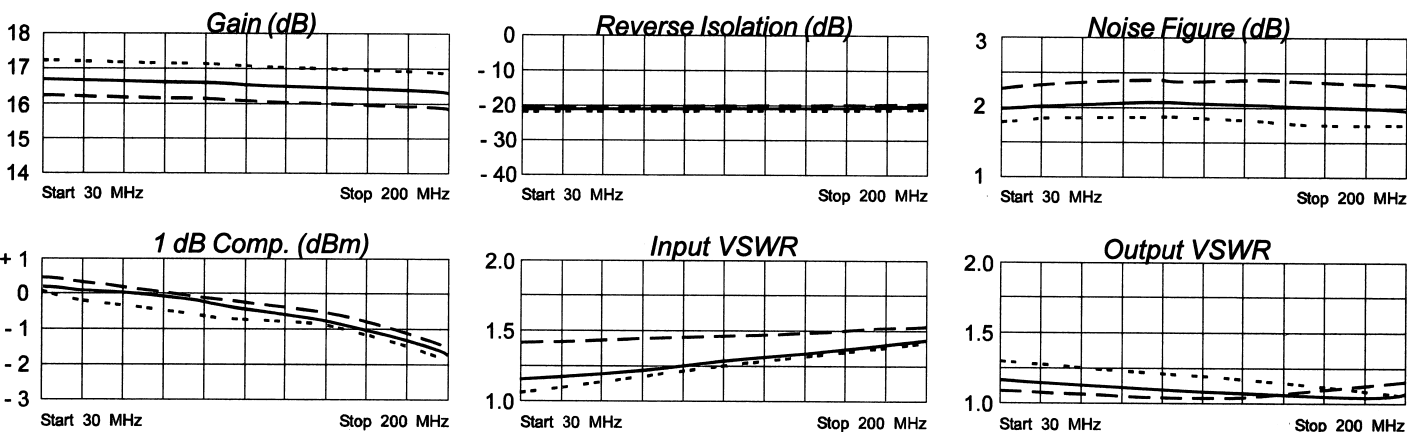
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +17 (Typ.)
 Second Order Two Tone Intercept Point +11 (Typ.)
 Third Order Two Tone Intercept Point +11 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	171	6.82	179	.10	2	.09	-179
30	.07	147	6.80	174	.10	0	.09	174
50	.08	135	6.80	169	.09	- 1	.08	170
100	.11	100	6.75	158	.10	- 4	.06	156
150	.14	75	6.64	147	.10	- 7	.04	154
200	.18	56	6.50	136	.10	- 8	.01	-120
300	.24	24	6.21	114	.10	-16	.09	- 74

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RF AMPLIFIER

MODEL *TM6515*

Available as: TM6515, 4 Pin TO-8 (T4)
 TN6515, 4 Pin Surface Mount (SM3)
 FP6515, 4 Pin Flatpack (FP4)
 BX6515, Connectorized Housing (H1)

Features

- Medium Gain: +12.5 dB Typical
- Medium Output Power: +16.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	12.5	11.0 Min.
Power @ 1 dB Comp. (dBm)	+16.5	+15.0 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	5.5 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

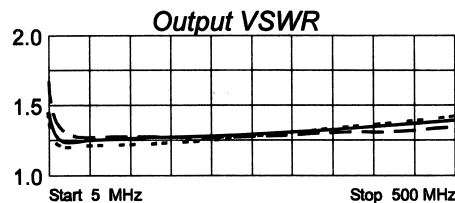
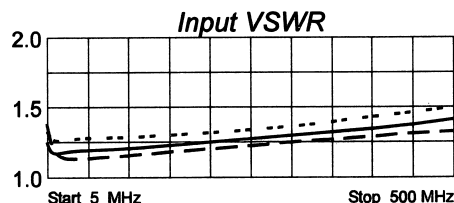
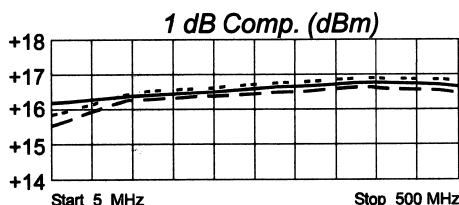
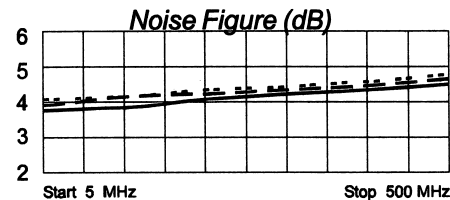
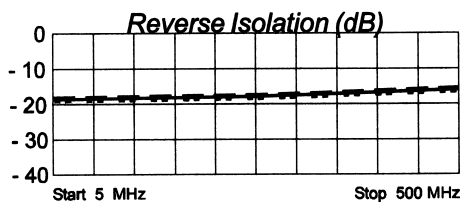
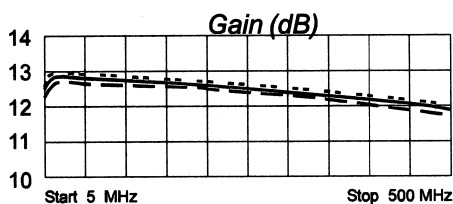
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-126	4.26	-172	.13	9	.18	144
50	.09	171	4.37	173	.14	- 0	.11	175
100	.09	150	4.34	164	.14	- 2	.11	-178
200	.11	125	4.26	147	.14	- 6	.12	-172
300	.13	106	4.17	131	.14	- 9	.14	-170
400	.15	89	4.03	115	.15	-13	.15	-174
500	.17	78	3.92	100	.15	-18	.17	179
600	.18	68	3.79	85	.16	-23	.18	171

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RF AMPLIFIER

MODEL *TM6516*

Available as: TM6516, 4 Pin TO-8 (T4)
 TN6516, 4 Pin Surface Mount (SM3)
 FP6516, 4 Pin Flatpack (FP4)
 BX6516, Connectorized Housing (H1)

Features

- Medium Gain: +14.5 dB Typical
- Medium Output Power: +14 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.5	13.5 Min.
Power @ 1 dB Comp. (dBm)	+14	+12.0 Min.
Reverse Isolation (dB)	-17.5	-17 Max.
VSWR In	<1.4:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	<4.0	4.5 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

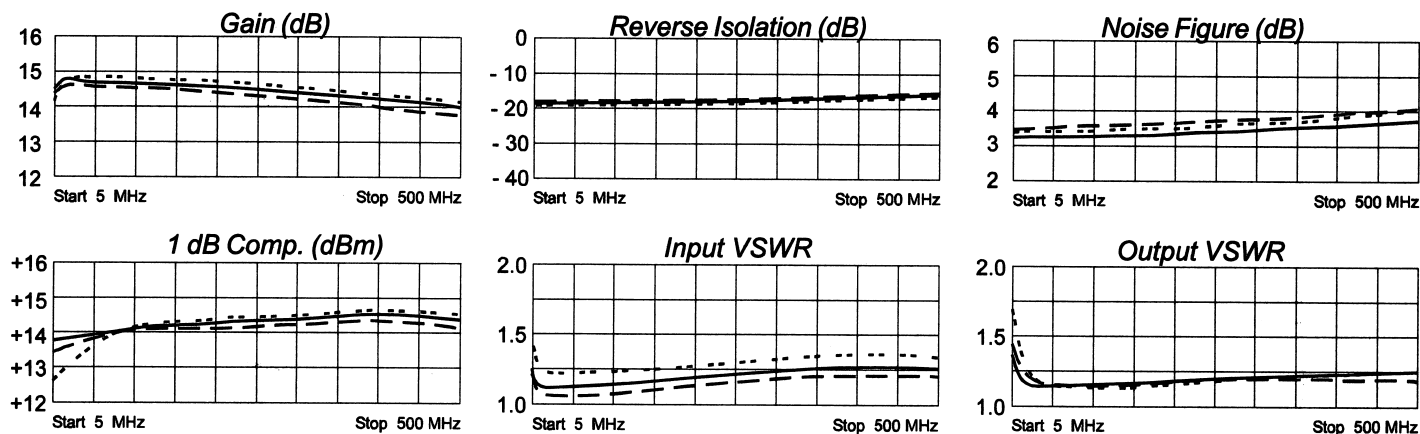
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-101	5.26	-170	.11	11	.17	137
50	.06	168	5.45	172	.12	0	.07	167
100	.06	135	5.44	162	.12	-2	.07	179
200	.09	103	5.34	144	.12	-5	.07	-175
300	.11	84	5.22	126	.12	-8	.09	-172
400	.12	71	5.09	109	.13	-12	.10	178
500	.11	65	4.97	91	.14	-17	.11	166
600	.10	68	4.83	73	.15	-23	.10	142

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RF AMPLIFIER

MODEL *TM6517*

Available as: TM6517, 4 Pin TO-8 (T4)
 TN6517, 4 Pin Surface Mount (SM3)
 FP6517, 4 Pin Flatpack (FP4)
 BX6517, Connectorized Housing (H1)

Features

- High Gain: 22.5 dB Gain Typical
- Low Noise Figure: <2.4 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	22.5	21.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+8.0 Min.
Reverse Isolation (dB)	- 24	- 21 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.4	3.0 Max.
Power Vdc	+15	+15
mA	22	25 Max.

Note: Care should always be taken to effectively ground the case of each unit.

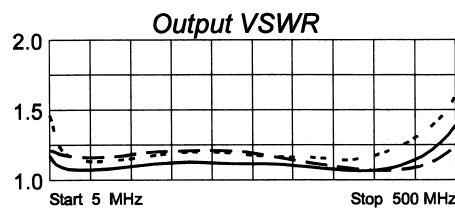
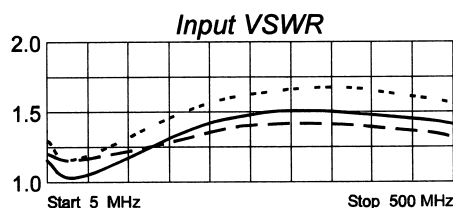
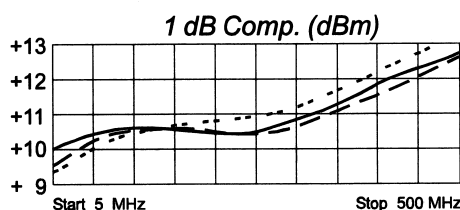
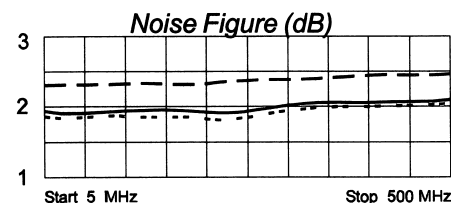
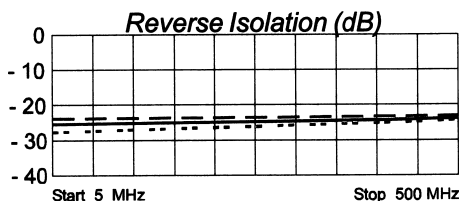
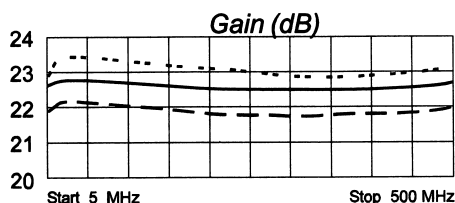
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +32 (Typ.)
 Second Order Two Tone Intercept Point +26 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.07	-127	13.16	-174	.05	10	.09	112
50	.06	136	13.33	165	.05	-4	.02	29
100	.08	96	13.17	150	.05	-8	.03	-19
200	.12	38	12.80	119	.05	-19	.06	-44
300	.15	-9	12.33	89	.06	-35	.09	-54
400	.14	-52	12.16	58	.06	-48	.13	-51
500	.09	-126	12.35	24	.06	-69	.22	-38

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RF AMPLIFIER

MODEL *TM6518*

Available as: TM6518, 4 Pin TO-8 (T4)
 TN6518, 4 Pin Surface Mount (SM3)
 FP6518, 4 Pin Flatpack (FP4)
 BX6518, Connectorized Housing (H1)

Features

- High Power: +25 dBm Typical 1 dB Comp.
- Noise Figure: 5.25 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+25	+22.5 Min.
Reverse Isolation (dB)	- 16.5	- 15.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.3:1	2.0:1 Max.
Noise figure (dB)	5.25	6.5 Max.
Power Vdc	+15	+15
mA	125	135 Max.

Note: Care should always be taken to effectively ground the case of each unit.

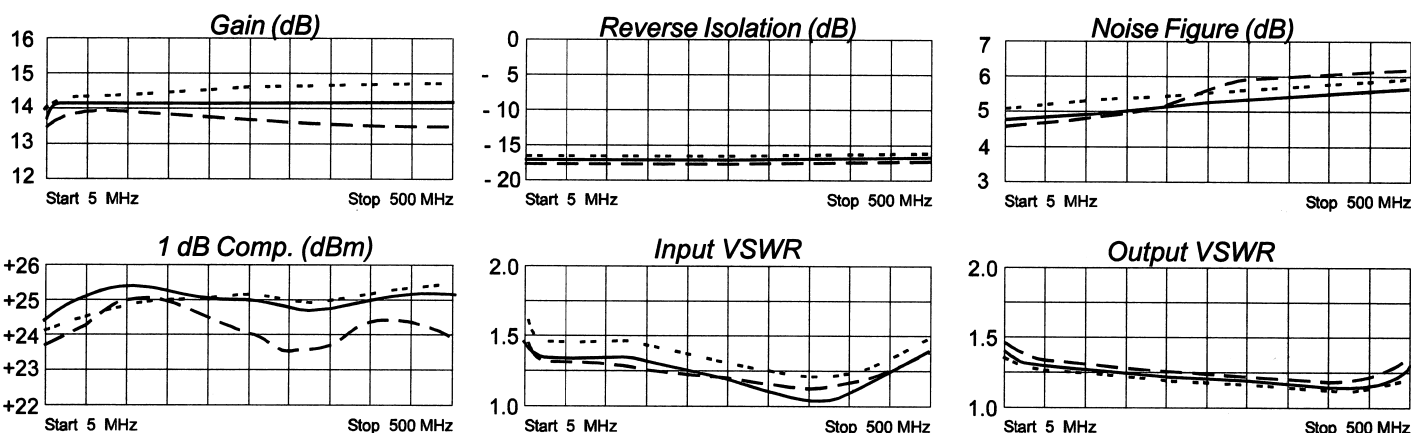
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.17	-135	4.89	-189	.11	14	.24	159
50	.14	165	5.04	169	.12	0	.18	166
100	.14	140	5.02	156	.12	-1	.17	160
200	.14	101	5.03	132	.12	-7	.15	144
300	.15	60	5.06	107	.13	-12	.14	136
400	.16	27	5.08	80	.14	-19	.13	140
500	.18	3	5.11	52	.15	-28	.19	143

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RF AMPLIFIER

MODEL *TM6519*

Available as: TM6519, 4 Pin TO-8 (T4)
 TN6519, 4 Pin Surface Mount (SM3)
 FP6519, 4 Pin Flatpack (FP4)
 BX6519, Connectorized Housing (H1)
 PN6519, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +19 dBm Typical
- High Third Order Intercept: > +33 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	14.3	12.0 Min.
Power @ 1 dB Comp. (dBm)	>+19	+17.0 Min.
Reverse Isolation (dB)	- 16	-15.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.6:1	2.0:1 Max.
Noise figure (dB)	<5.5	6.0 Max.
Power Vdc	+15	+15
mA	70	73 Max.

Note: Care should always be taken to effectively ground the case of each unit.

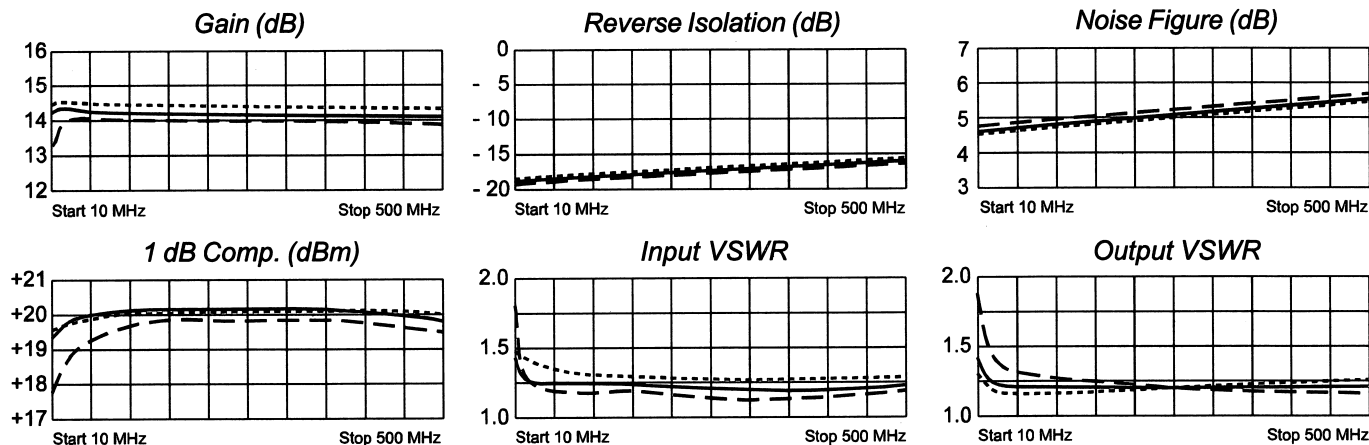
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---- S11 ----		---- S21 ----		---- S12 ----		---- S22 ----	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
5	.17	-109	5.21	-164	.11	18	.22	135
10	.12	-135	5.33	-174	.11	9	.13	139
50	.09	-179	5.39	172	.12	1	.09	160
100	.09	168	5.39	162	.12	- 1	.08	156
200	.07	119	5.40	142	.12	- 4	.07	150
300	.06	73	5.39	122	.13	- 9	.07	138
400	.07	17	5.38	102	.14	-15	.07	133
500	.08	- 30	5.34	82	.15	-22	.08	121

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RF AMPLIFIER

MODEL *TM6520*

Available as: TM6520, 4 Pin TO-8 (T4)
 TN6520, 4 Pin Surface Mount (SM3)
 FP6520, 4 Pin Flatpack (FP4)
 BX6520, Connectorized Housing (H1)

Features

- High Efficiency: 13 dBm Typ. @ 170 mW DC
- Low Noise Figure: <3.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.5	13.5 Min.
Power @ 1 dB Comp. (dBm)	+13	+11.5 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.3:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+5	+5
mA	33	36 Max.

Note: Care should always be taken to effectively ground the case of each unit.

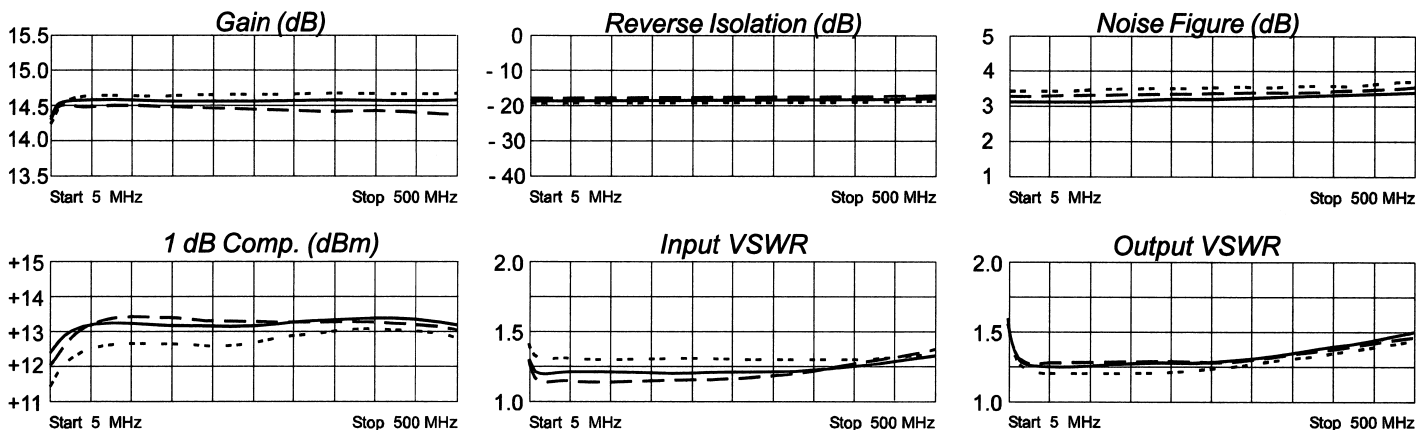
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +34 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.15	- 74	5.43	-167	.10	14	.20	124
50	.06	-160	5.52	171	.11	0	.05	151
100	.06	-162	5.51	161	.11	- 3	.05	152
200	.05	-149	5.49	140	.11	- 8	.03	158
300	.07	-128	5.49	120	.12	-12	.03	171
400	.10	-123	5.47	99	.13	-19	.03	176
500	.14	-130	5.41	78	.14	-27	.04	-179

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RF AMPLIFIER

MODEL *TM6521*

Available as: TM6521, 4 Pin TO-8 (T4)
 TN6521, 4 Pin Surface Mount (SM3)
 FP6521, 4 Pin Flatpack (FP4)
 BX6521, Connectorized Housing (H1)

Features

- High Gain: +30 dB Typical
- Low Noise Figure: <3.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	30	28 Min.
Power @ 1 dB Comp. (dBm)	+9	+7 Min.
Reverse Isolation (dB)	- 34	- 33 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	36	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

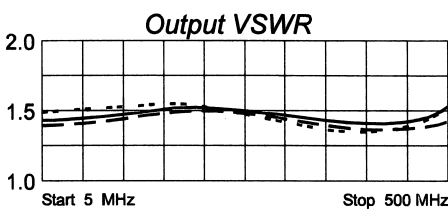
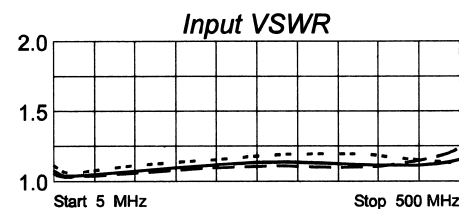
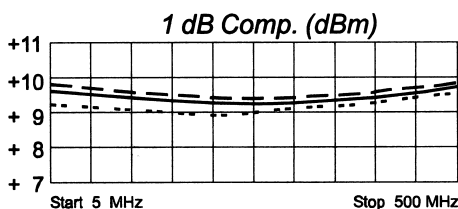
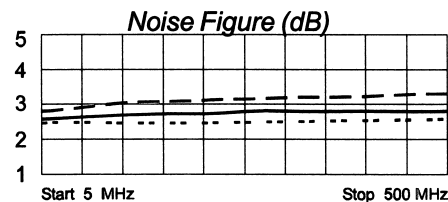
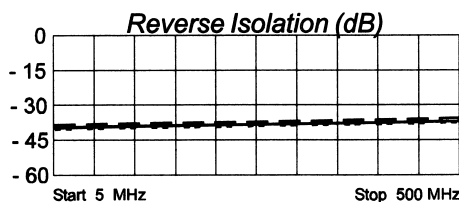
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	-113	35.56	3	.01	5	.18	-172
50	.02	-150	34.77	- 24	.01	0	.19	-176
100	.03	-161	34.64	- 48	.01	5	.20	-174
200	.05	160	34.41	- 96	.01	- 3	.21	-179
300	.06	112	34.10	-146	.01	- 5	.19	174
400	.06	40	33.10	162	.01	- 7	.17	177
500	.08	- 65	31.40	106	.02	-22	.20	160
600	.17	-147	26.97	42	.02	-37	.26	78

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RF AMPLIFIER

MODEL *TM6523*

Available as: TM6523, 4 Pin TO-8 (T4)
 TN6523, 4 Pin Surface Mount (SM3)
 FP6523, 4 Pin Flatpack (FP4)
 BX6523, Connectorized Housing (H1)

Features

- High Gain: 25.5 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	25.5	23.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.0 Min.
Reverse Isolation (dB)	- 33	- 32 Max.
VSWR In	<1.3:1	2.0:1 Max.
VSWR Out	<1.3:1	2.0:1 Max.
Noise figure (dB)	5.5	7.0 Max.
Power Vdc	+15	+15
mA	75	80 Max.

Note: Care should always be taken to effectively ground the case of each unit.

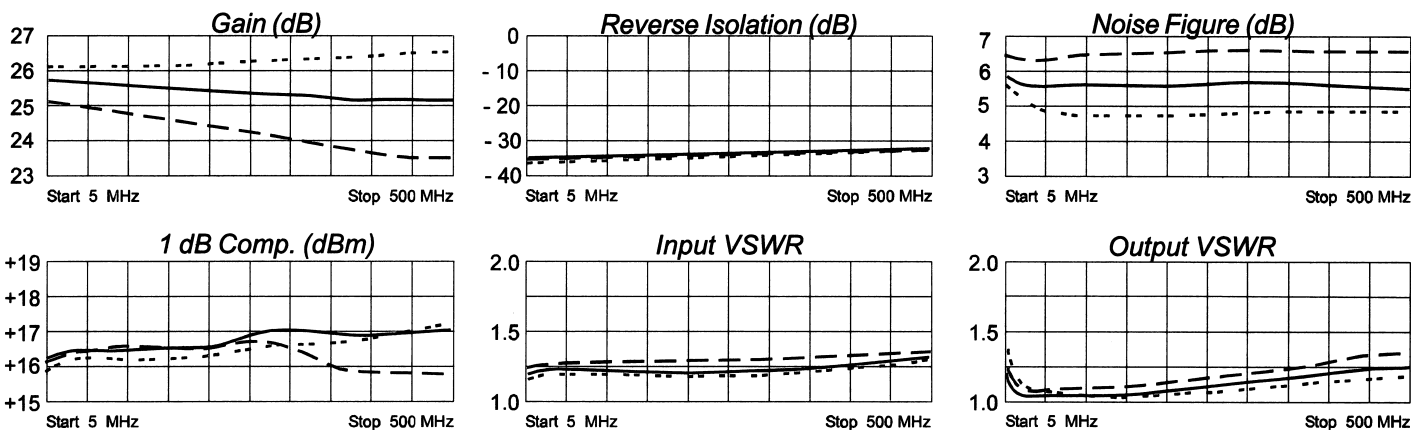
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.10	14	19.48	9	.02	12	.10	103
50	.11	-1	19.27	-17	.02	-0	.02	66
100	.10	-4	19.09	-35	.02	1	.02	59
200	.11	-2	18.74	-70	.02	5	.04	64
300	.11	-2	18.47	-104	.02	1	.07	47
400	.13	-6	18.31	-139	.02	0	.09	22
500	.14	-19	18.39	-173	.02	-2	.11	-11

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RF AMPLIFIER

MODEL *TM6524*

Available as: TM6524, 4 Pin TO-8 (T4)
 TN6524, 4 Pin Surface Mount (SM3)
 FP6524, 4 Pin Flatpack (FP4)
 BX6524, Connectorized Housing (H1)

Features

- High Gain : 31 dB Typical
- Medium Output Power: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	31	29.0 Min.
Power @ 1 dB Comp. (dBm)	+15	+14.0 Min.
Reverse Isolation (dB)	- 36	- 35 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.0 Max.
Power Vdc	+15	+15
mA	70	75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

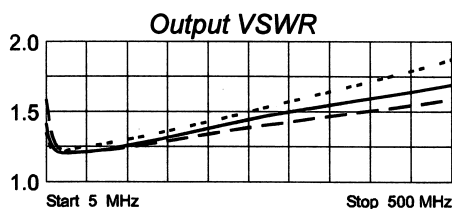
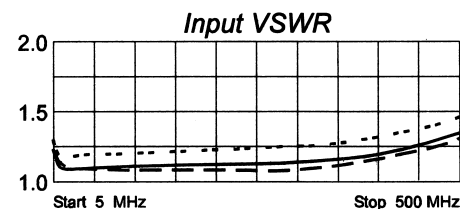
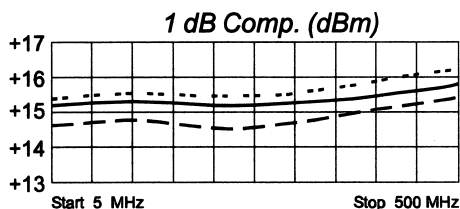
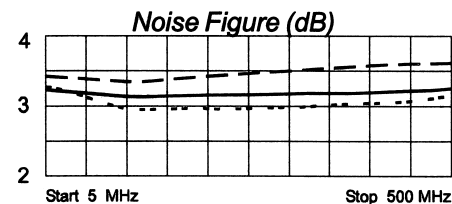
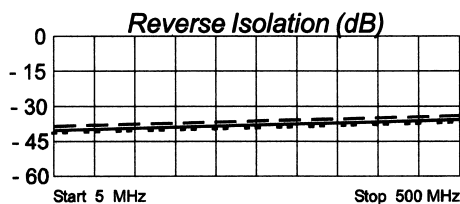
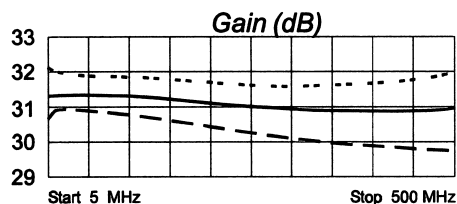
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.09	140	36.70	11	.01	16	.17	134
50	.03	172	36.52	-17	.01	4	.09	176
100	.04	-180	36.06	-36	.01	5	.10	180
200	.04	163	34.99	-71	.01	2	.15	166
300	.04	125	34.61	-105	.01	- 3	.21	142
400	.07	58	34.92	-141	.01	- 6	.26	111
500	.13	8	35.06	-171	.01	-20	.32	77
600	.22	- 28	34.94	143	.01	-30	.34	41

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RF AMPLIFIER

MODEL *TM6526*

Available as: TM6526, 4 Pin TO-8 (T4)
 TN6526, 4 Pin Surface Mount (SM3)
 FP6526, 4 Pin Flatpack (FP4)
 BX6526, Connectorized Housing (H1)

Features

- High Gain: 28 dB Typical
- High Output Power: +20.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	28	26.0 Min.
Power @ 1 dB Comp. (dBm)	+20.5	+18.5 Min.
Reverse Isolation (dB)	- 38	- 35 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.75	4.0 Max.
Power Vdc	+15	+15
mA	93	96 Max.

Note: Care should always be taken to effectively ground the case of each unit.

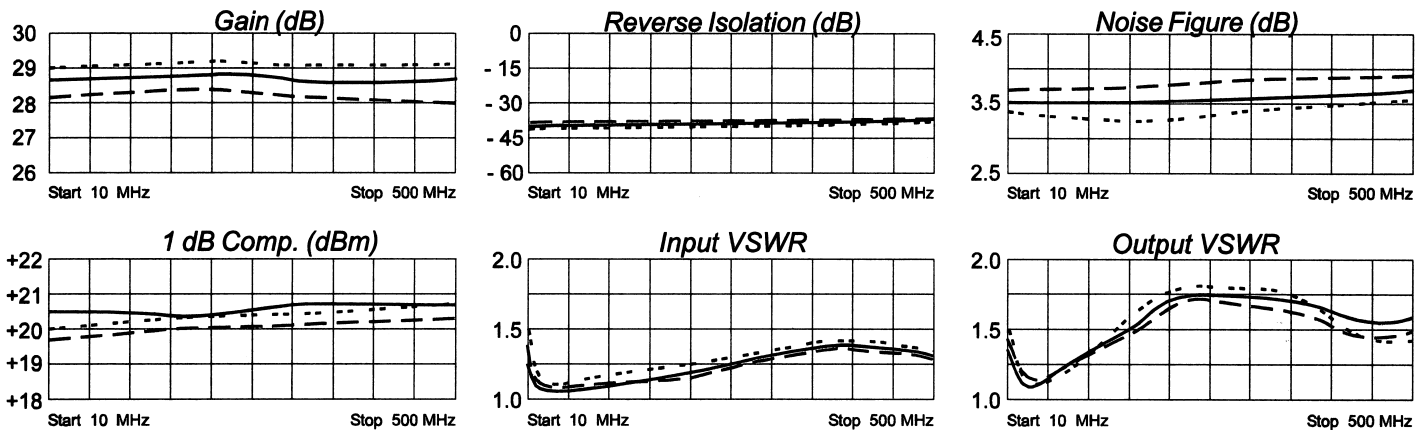
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.07	95	26.94	9	.01	18	.13	128
50	.03	90	27.31	- 18	.01	5	.06	-155
100	.04	90	27.35	- 41	.01	- 12	.12	-142
200	.09	84	27.23	- 84	.01	- 10	.23	-161
300	.15	55	26.84	-129	.01	- 28	.25	165
400	.16	27	26.60	-173	.01	- 60	.24	128
500	.12	- 3	27.36	139	.01	- 45	.24	76

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RF AMPLIFIER

MODEL *TM6533*

Available as: TM6533, 4 Pin TO-8 (T4)
 TN6533, 4 Pin Surface Mount (SM3)
 FP6533, 4 Pin Flatpack (FP4)
 BX6533, Connectorized Housing (H1)

Features

- High Gain: 16.5 dB Typical
- Medium Output Power: +17 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+17	+15.0 Min.
Reverse Isolation (dB)	- 18.5	- 17 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.5	5.5 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

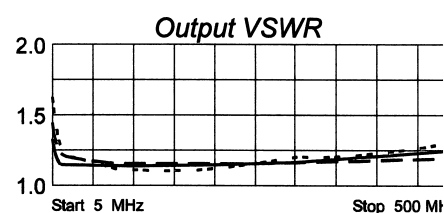
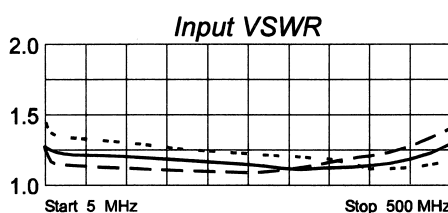
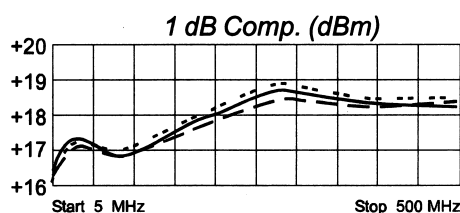
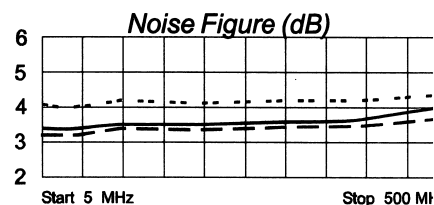
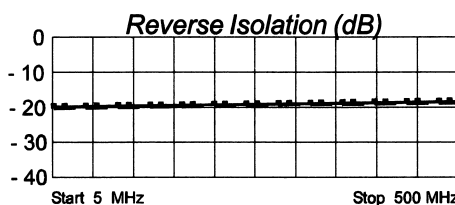
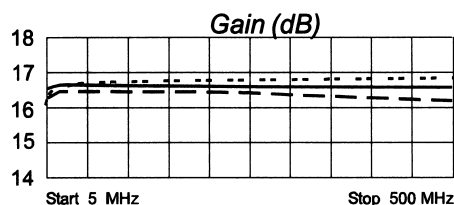
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ)
 Second Order Two Tone Intercept Point +42 (Typ)
 Third Order Two Tone Intercept Point +32 (Typ)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Maximum)
 Maximum Peak Power 0.5 Watt
 (3 µsec Maximum)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	-121	6.73	-170	.09	11	.15	136
50	.09	-180	6.90	171	.10	-0	.06	161
100	.08	170	6.88	159	.09	-1	.05	170
200	.07	161	6.85	138	.10	-2	.05	171
300	.05	170	6.79	117	.10	-4	.07	162
400	.07	-164	6.79	94	.11	-8	.09	148
500	.13	-158	6.71	70	.12	-12	.12	122

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RF AMPLIFIER

MODEL *TR6535*

Available as: RN6535, 4 Pin Surface Mount (SM19)
BR6535, Connectorized Housing (H2)

Features

- High Gain: 32.5 dB Typical
- Low Noise: 2 dB Typical
- High Power: +22 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	32.5	30.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 36	- 35 Max.
VSWR In	1.75:1	2.5:1 Max.
Out	1.5:1	2.5:1 Max.
Noise figure (dB)	1.8	3.0 Max.
Power Vdc	+15	+15
mA	90	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

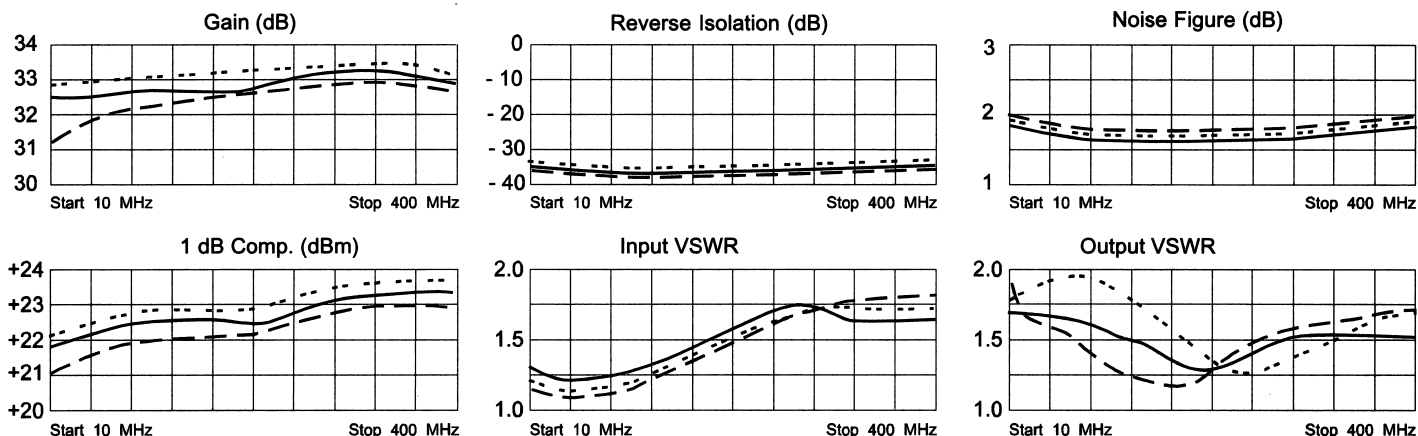
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +54 (Typ.)
Second Order Two Tone Intercept Point +48 (Typ.)
Third Order Two Tone Intercept Point +37 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	-117	42.18	12	.01	13	.26	5
50	.07	-154	42.28	-22	.01	-18	.23	-23
100	.06	-136	42.36	-49	.01	-51	.17	-51
200	.18	-134	42.67	-101	.01	-121	.01	-21
300	.24	-167	42.80	-156	.01	-164	.14	-3
400	.25	-178	40.98	142	.02	139	.17	-123

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RF AMPLIFIER

MODEL *TM6543*

Available as: TM6543, 4 Pin TO-8 (T4)
 TN6543, 4 Pin Surface Mount (SM3)
 FP6543, 4 Pin Flatpack (FP4)
 BX6543, Connectorized Housing (H1)
 PN6543, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: <2.5 dB Typical
- Medium Output Power: +11 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		10 - 500 MHz	10 - 500 MHz
Gain (dB)		11	10.0 Min.
Power @ 1 dB Comp. (dBm)		+11	+9.0 Min.
Reverse Isolation (dB)		- 13.5	- 13 Max.
VSWR	In Out	<1.5:1 <1.75:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		<2.5	3.0 Max.
Power	Vdc mA	+15 25	+15 27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

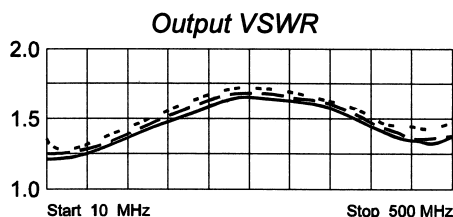
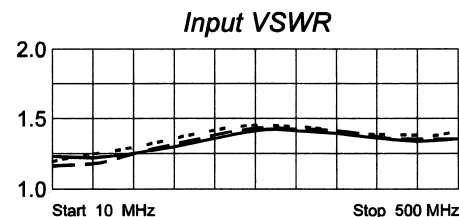
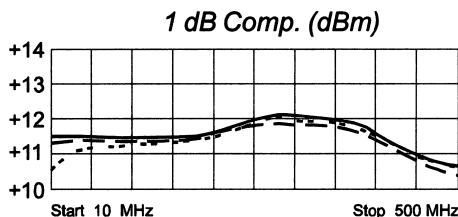
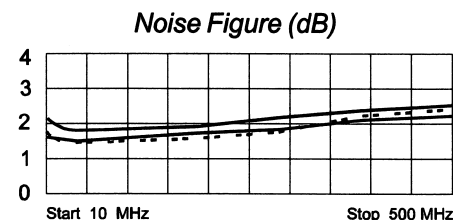
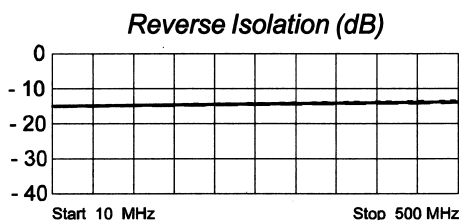
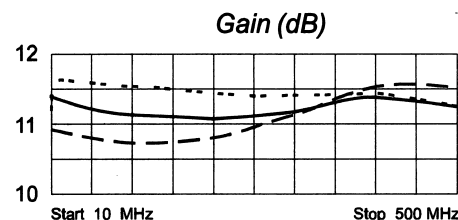
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 50 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	-15	3.73	-176	.18	-177	.10	-162
50	.10	5	3.65	166	.18	163	.11	132
100	.11	21	3.61	151	.18	145	.15	88
200	.18	23	3.59	123	.18	111	.24	30
300	.19	10	3.62	95	.18	79	.25	-22
400	.17	6	3.72	62	.19	49	.18	-80
500	.17	23	3.65	25	.19	14	.16	151

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RF AMPLIFIER

MODEL *TM6544*

Available as: TM6544, 4 Pin TO-8 (T4)
 TN6544, 4 Pin Surface Mount (SM3)
 FP6544, 4 Pin Flatpack (FP4)
 BX6544, Connectorized Housing (H1)

Features

- Low Noise: 2 dB Typ.
- High Dynamic Range IP3 = +32 dBm Typ.
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	12	10.5 Min.
Power @ 1 dB Comp. (dBm)	+15	+13.0 Min.
Reverse Isolation (dB)	- 15.5	- 14.5 Max.
VSWR In	<1.35:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.0	3.5 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

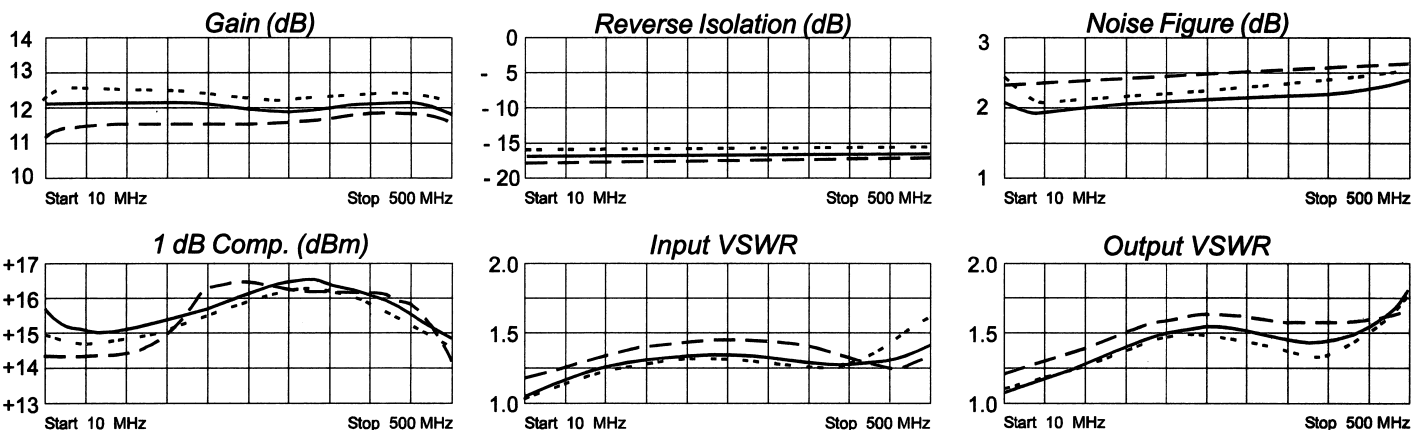
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.01	-33	4.01	-174	.16	-174	.01	-7
50	.04	63	4.03	168	.16	168	.06	70
100	.09	51	4.00	153	.16	153	.12	66
200	.15	14	3.96	126	.16	126	.20	50
300	.15	-30	3.95	99	.16	99	.21	40
400	.11	-103	4.02	69	.16	71	.19	52
500	.18	150	3.93	34	.16	40	.28	78

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RF AMPLIFIER MODEL *TM6545*

Available as: TM6545, 4 Pin TO-8 (T4)
TN6545, 4 Pin Surface Mount (SM3)
FP6545, 4 Pin Flatpack (FP4)
BX6545, Connectorized Housing (H1)

Features

- High Dynamic Range
- High Output Power: +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+20.5	+18.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+15	+15
mA	60	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54 (Typ.)

Second Order Two Tone Intercept Point +48 (Typ.)

Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 18 Volts

Continuous RF Input Power + 13 dBm

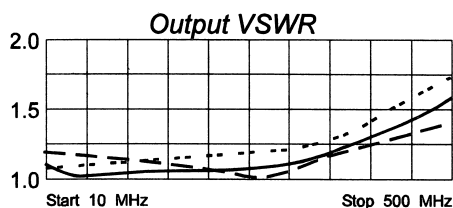
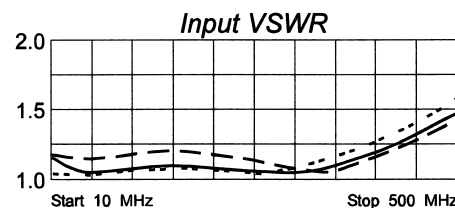
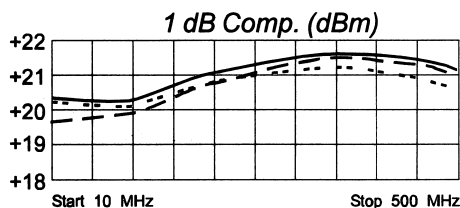
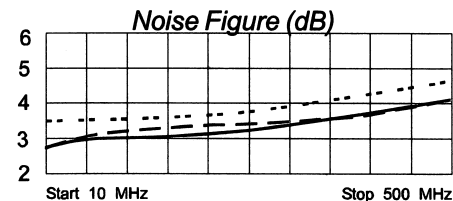
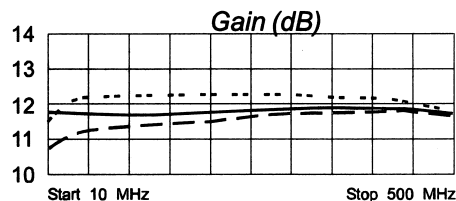
Short Term RF Input Power 50 Milliwatts

(1 Minute Max.)

Maximum Peak Power 0.5 Watt

(3 μsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.04	-76	3.93	-174	.16	-174	.03	-55
50	.04	75	3.89	168	.16	167	.04	64
100	.09	58	3.86	155	.16	153	.08	62
200	.16	21	3.88	130	.16	126	.13	45
300	.18	-23	3.94	104	.17	101	.12	32
400	.17	-87	4.06	76	.17	75	.08	67
500	.22	-169	4.04	44	.18	49	.19	106

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RF AMPLIFIER

MODEL *TM6546*

Available as: TM6546, 4 Pin TO-8 (T4)
TN6546-3, 4 Pin Surface Mount (SM3)
FP6546-4, 4 Pin Flatpack (FP4)
BX6546, Connectorized Housing (H1)

Features

- High I_{p3} : > +38 dBm Typical
- High Output Power: +25 dBm Typical
- Operating Temp. - 55 °C to +85 °C

Specifications

CHARACTERISTIC	TYPICAL $T_a = 25\text{ }^{\circ}\text{C}$	MIN/MAX $T_a = -55\text{ }^{\circ}\text{C to } +85\text{ }^{\circ}\text{C}$
Frequency	20 - 500	20 - 500
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+25	+23 Min.
Reverse Isolation (dB)	- 19	-18 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.7:1	2.0:1 Max.
Noise figure (dB)	4.0	6.0 Max.
Power Vdc	+15	+15
mA	105	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

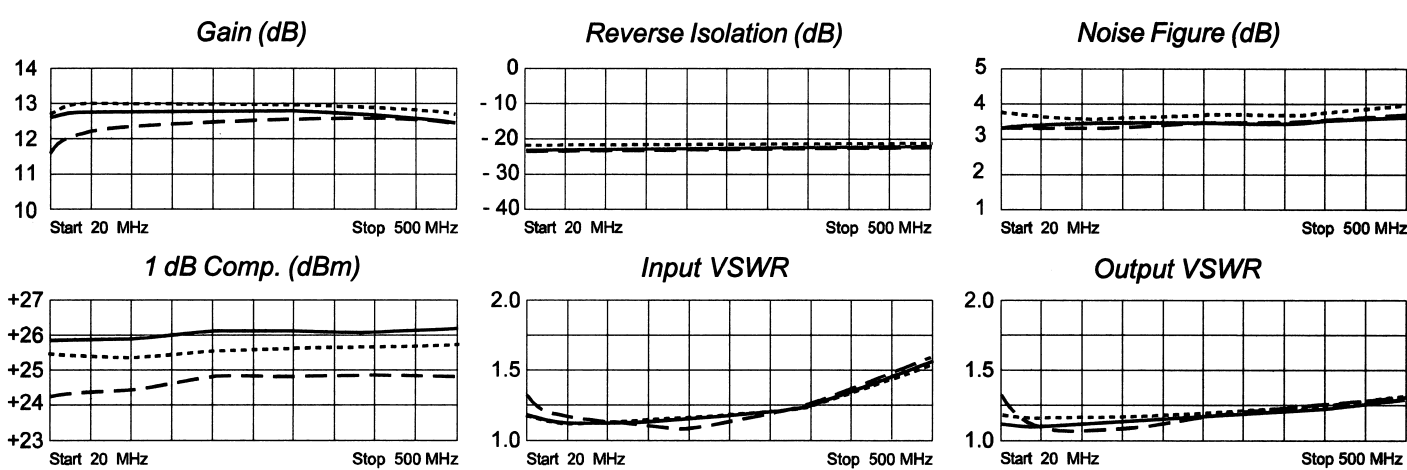
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
Second Order Two Tone Intercept Point +45 (Typ.)
Third Order Two Tone Intercept Point +38 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 μ sec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters								
Freq MHz	----S11----		----S21----		----S12----		----S22----	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.19	165	3.80	-171	.09	-173	.19	31
50	.17	-179	3.88	163	.09	160	.19	-24
100	.19	-176	3.85	142	.09	139	.22	-60
200	.24	171	3.70	104	.09	98	.27	-111
300	.26	146	3.65	67	.09	62	.30	-153
400	.21	117	3.62	28	.10	27	.26	170
500	.16	96	3.64	-16	.11	-9	.17	132



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RF AMPLIFIER

MODEL *TM6547*

Available as: TM6547, 4 Pin TO-8 (T4)
 TN6547, 4 Pin Surface Mount (SM3)
 FP6547, 4 Pin Flatpack (FP4)
 BX6547, Connectorized Housing (H1)
 PN6547, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: < 4.0 dB Typical
- High Output Power: +19 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	12.5	11.0 Min.
Power @ 1 dB Comp. (dBm)	+19	+17.5 Min.
Reverse Isolation (dB)	- 17	- 15 Max.
VSWR In	1.75:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	4.5 Max.
Power Vdc	+15	+15
mA	55	58 Max.

Note: Care should always be taken to effectively ground the case of each unit.

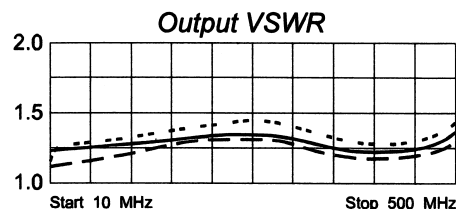
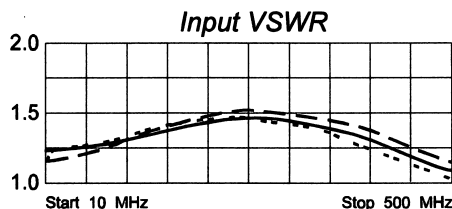
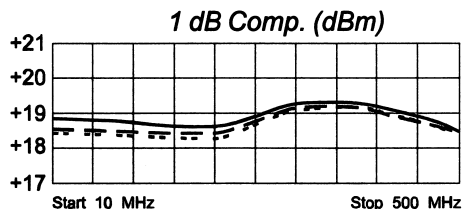
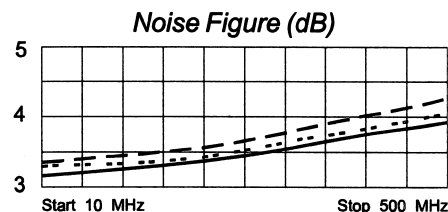
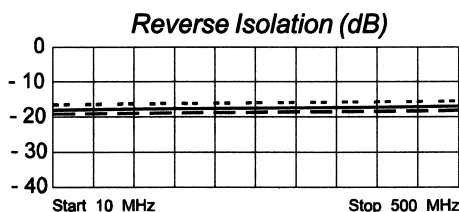
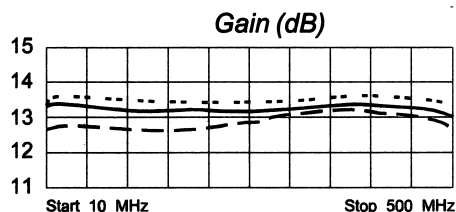
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.10	-13	4.62	-173	.13	-174	.10	- 8
50	.10	7	4.62	169	.13	169	.11	3
100	.12	14	4.57	155	.13	153	.12	5
200	.17	6	4.54	129	.13	127	.15	- 8
300	.18	-16	4.53	103	.13	102	.14	- 39
400	.13	-44	4.52	75	.14	76	.12	- 94
500	.04	-89	4.43	43	.14	50	.17	-170
600	.09	92	4.05	10	.15	22	.31	140

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Rev. A 06/11/01

RF AMPLIFIER

MODEL *TM6554*

Available as: TM6554, 4 Pin TO-8 (T4)
 TN6554, 4 Pin Surface Mount (SM3)
 FP6554, 4 Pin Flatpack (FP4)
 BX6554, Connectorized Housing (H1)

Features

- High Gain: 27.5 dB Typical
- Medium Output Power: +8 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 400 MHz	5 - 400 MHz
Gain (dB)	27.5	25.0 Min.
Power @ 1 dB Comp. (dBm)	+8	+6.0 Min.
Reverse Isolation (dB)	- 35	- 34 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5	6.0 Max.
Power Vdc	+15	+15
mA	33	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

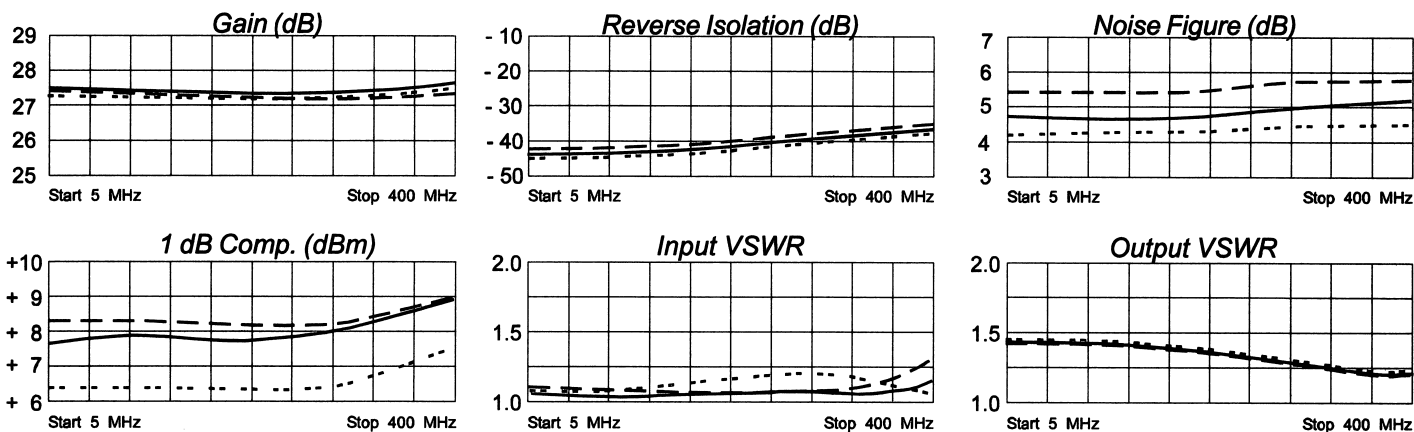
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.02	-103	23.84	2	.01	5	.18	-8
50	.01	-156	23.68	-24	.01	10	.17	-19
100	.02	-176	23.47	-48	.01	14	.17	-37
200	.04	145	23.18	-96	.01	10	.15	-71
300	.02	108	23.37	-145	.13	12	.12	-110
400	.08	-96	24.69	164	.15	-10	.09	164

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RF AMPLIFIER

MODEL *TM6555*

Available as: TM6555, 4 Pin TO-8 (T4)
 TN6555, 4 Pin Surface Mount (SM3)
 FP6555, 4 Pin Flatpack (FP4)
 BX6555, Connectorized Housing (H1)

Features

- Medium Gain: 14.7 dB Typical
- Medium Output Power: +11.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)	+11.5	+9.0 Min.
Reverse Isolation (dB)	- 18.5	- 17.5 Max.
VSWR In	1.15:1	2.0:1 Max.
Out	1.25:1	2.0:1 Max.
Noise figure (dB)	4.0	6.5 Max.
Power Vdc	+15	+15
mA	33	36 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)

Second Order Two Tone Intercept Point +35 (Typ.)

Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 18 Volts

Continuous RF Input Power + 13 dBm

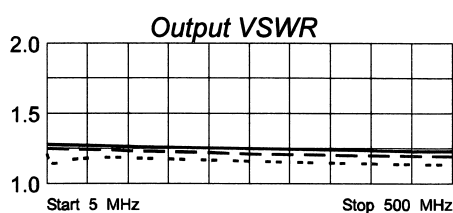
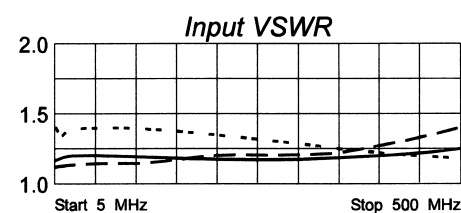
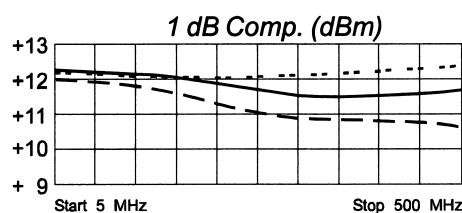
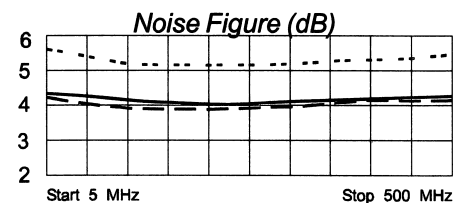
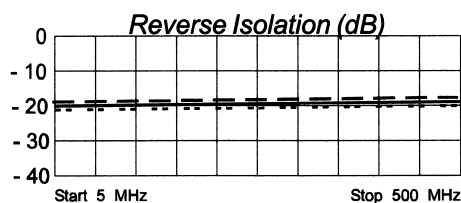
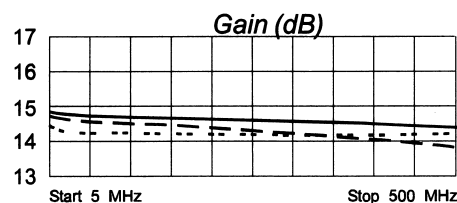
Short Term RF Input Power 50 Milliwatts

(1 Minute Max.)

Maximum Peak Power 0.5 Watt

(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.07	-179	5.56	-176	.10	2	.13	179
50	.08	179	5.49	172	.10	- 0	.13	171
100	.08	172	5.45	164	.10	- 0	.13	162
200	.07	172	5.39	148	.10	- 1	.13	141
300	.07	173	5.35	132	.10	- 2	.12	125
400	.08	-175	5.31	116	.11	- 4	.12	107
500	.11	-166	5.21	99	.11	- 7	.13	89

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RF AMPLIFIER

MODEL *TM6556*

Available as: TM6556, 4 Pin TO-8 (T4)
 TN6556, 4 Pin Surface Mount (SM3)
 FP6556, 4 Pin Flatpack (FP4)
 BX6556, Connectorized Housing (H1)

Features

- High Gain: 26 dB Typical
- $IP_3 = +28$ dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 400 MHz	5 - 400 MHz
Gain (dB)	26	24.0 Min.
Power @ 1 dB Comp. (dBm)	+14	+12.5 Min.
Reverse Isolation (dB)	- 35	- 34 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	6.5 Max.
Power Vdc	+15	+15
mA	66	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

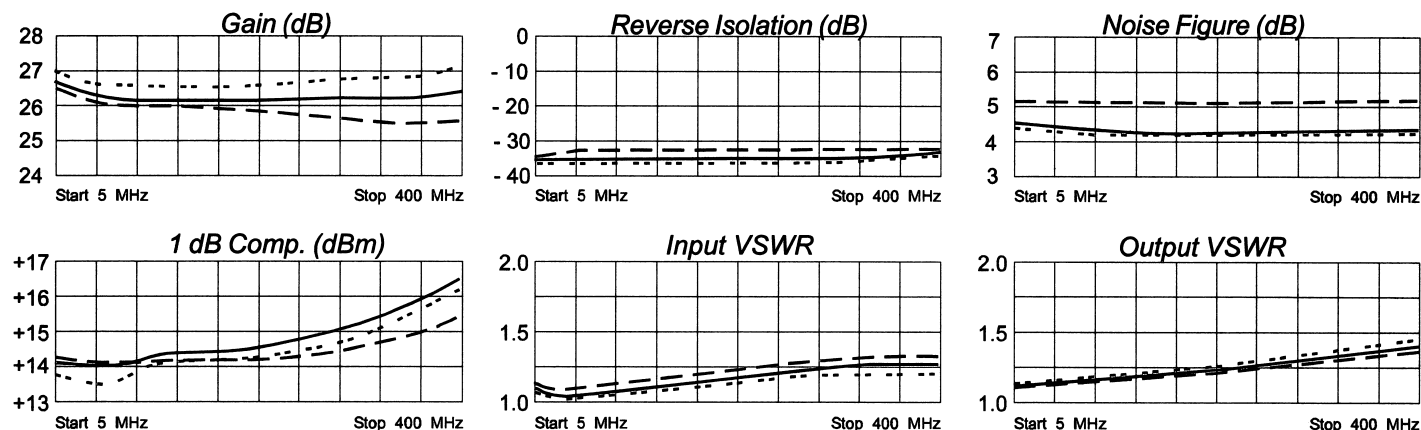
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +47 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.04	-51	22.01	4	.01	2	.05	-166
50	.02	25	21.35	- 20	.01	5	.06	-163
100	.04	42	21.18	- 40	.01	13	.07	-157
200	.08	31	20.92	- 78	.01	12	.11	-161
300	.10	6	20.79	-117	.01	17	.13	-172
400	.12	-23	21.20	-156	.02	13	.17	-178

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RF AMPLIFIER

MODEL *TM6557*

Available as: TM6557, 4 Pin TO-8 (T4)
 TN6557, 4 Pin Surface Mount (SM3)
 FP6557, 4 Pin Flatpack (FP4)
 BX6557, Connectorized Housing (H1)

Features

- Gain: 15 dB Typical
- Power Output: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	15	13.5 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+14.0 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In	1.20:1	2.0:1 Max.
Out	1.25:1	2.0:1 Max.
Noise figure (dB)	4.5	6.5 Max.
Power Vdc	+15	+15
mA	44	48 Max.

Note: Care should always be taken to effectively ground the case of each unit.

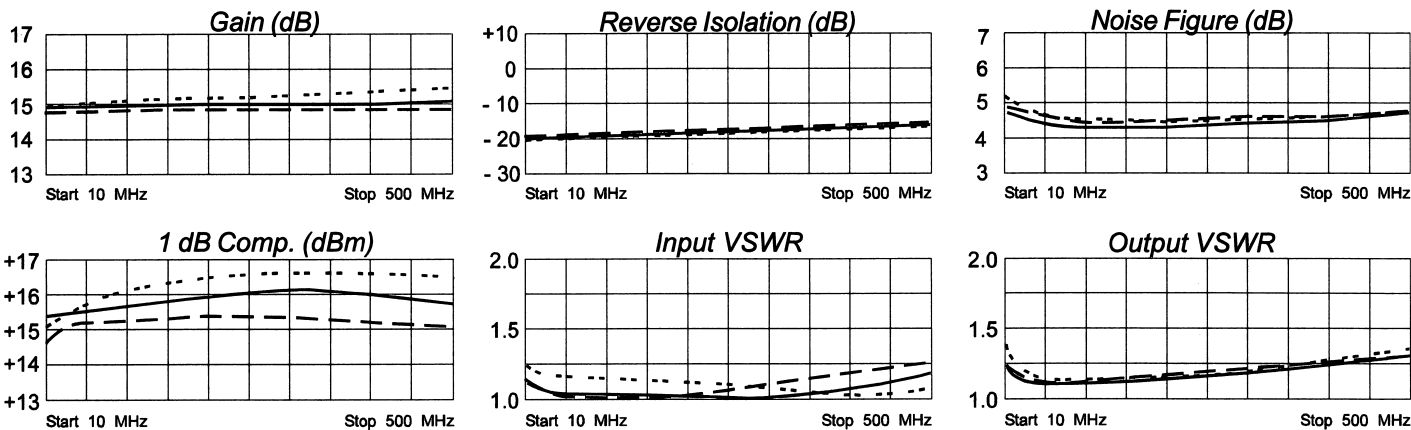
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.08	-85	5.61	-175	.11	8	.11	129
100	.02	166	5.64	165	.11	2	.05	135
200	.01	121	5.61	148	.11	2	.06	107
300	.03	-39	5.58	132	.12	3	.07	89
400	.06	-80	5.62	116	.13	-2	.09	63
500	.11	-96	5.62	99	.14	-2	.12	55

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RF AMPLIFIER

MODEL *TM6558*

Available as: TM6558, 4 Pin TO-8 (T4)
TN6558, 4 Pin Surface Mount (SM3)
FP6558, 4 Pin Flatpack (FP4)
BX6558, Connectorized Housing (H1)
PN6558, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +19 dBm Typical
- High Third Order Intercept: +36 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 500 MHz	5 - 500 MHz
Gain (dB)		12	10.5 Min.
Power @ 1 dB Comp. (dBm)		+19.0	+17.5 Min.
Reverse Isolation (dB)		- 16	- 15 Max.
VSWR	In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		4.8	6.5 Max.
Power	Vdc mA	+15 65	+15 72 Max.

Note: Care should always be taken to effectively ground the case of each unit.

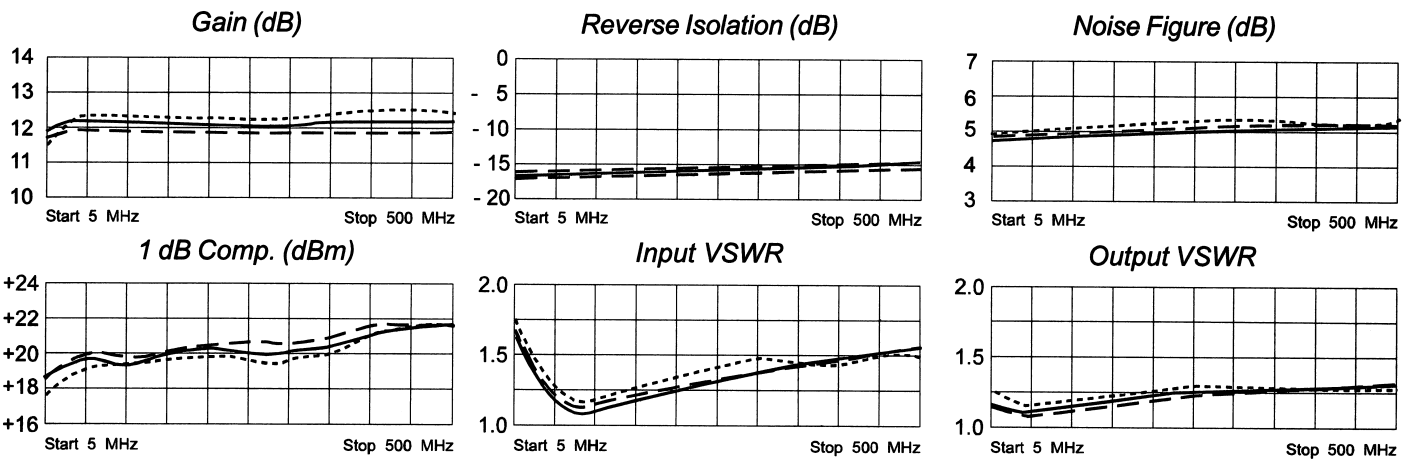
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +53 (Typ.)
Second Order Two Tone Intercept Point +48 (Typ.)
Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-65	3.93	-160	.14	6	.07	40
50	.04	- 2	4.07	168	.14	- 3	.06	10
100	.07	13	4.05	153	.14	- 7	.07	8
200	.12	- 1	3.99	125	.14	-15	.09	-10
300	.17	-25	3.97	97	.15	-25	.11	-40
400	.20	-48	4.00	68	.15	-35	.12	-72
500	.20	-71	4.05	39	.16	-45	.14	-114
600	.16	-87	4.12	7	.17	-58	.15	-168
700	.09	-57	4.01	-30	.19	-73	.17	130
800	.25	-28	3.52	-70	.20	-94	.22	63

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RF AMPLIFIER

MODEL *TM6559*

Available as: TM6559, 4 Pin TO-8 (T4)
 TN6559, 4 Pin Surface Mount (SM3)
 FP6559, 4 Pin Flatpack (FP4)
 BX6559, Connectorized Housing (H1)

Features

- Medium Gain: 11.5 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.5	7.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

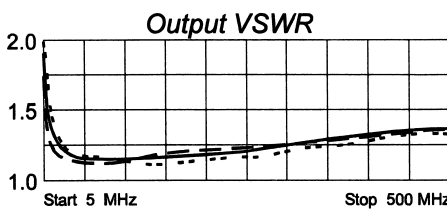
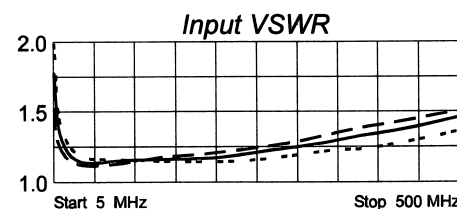
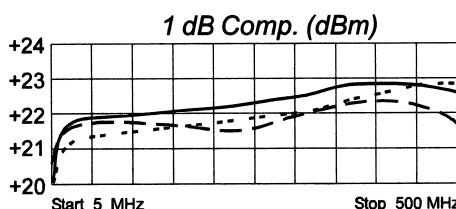
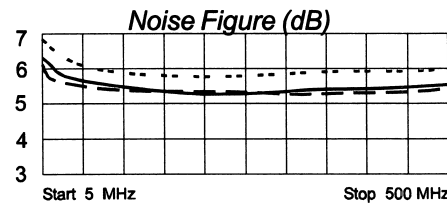
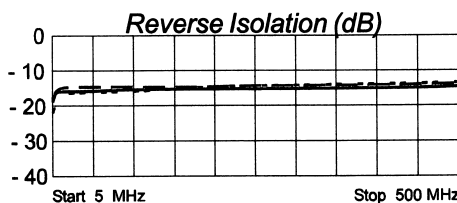
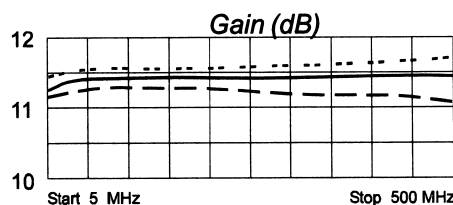
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.31	- 51	3.70	-154	.12	32	.39	113
50	.05	-112	3.65	175	.16	2	.07	110
100	.06	-121	3.66	166	.16	- 1	.07	102
200	.08	-121	3.66	149	.16	- 2	.09	81
300	.11	-127	3.65	133	.17	- 5	.11	71
400	.15	-134	3.67	117	.17	- 8	.14	59
500	.19	-142	3.66	101	.17	-12	.16	49

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RF AMPLIFIER

MODEL *TM6570*

Available as: TM6570, 4 Pin TO-8 (T4)
 TN6570, 4 Pin Surface Mount (SM3)
 FP6570, 4 Pin Flatpack (FP4)
 BX6570, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.5 dB Typical
- High Output Power: > +17.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	8.0	7.0 Min.
Power @ 1 dB Comp. (dBm)	>+17.5	+17.0 Min.
Reverse Isolation (dB)	- 11	- 9.5 Max.
VSWR In	<1.85:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+15	+15
mA	35	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

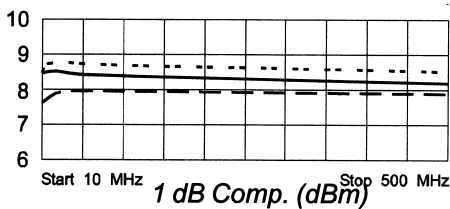
Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

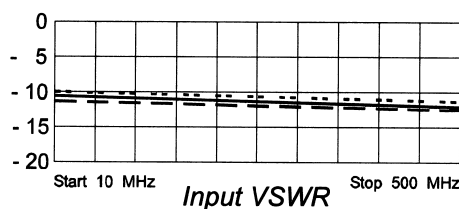
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

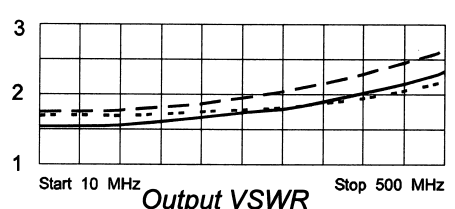
Gain (dB)



Reverse Isolation (dB)



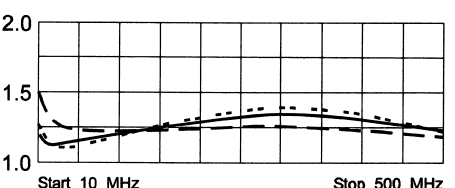
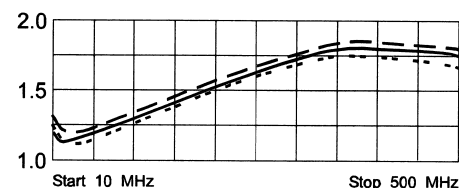
Noise Figure (dB)



1 dB Comp. (dBm)

Input VSWR

Output VSWR



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	148	2.56	12	.29	12	.13	150
50	.09	-160	2.63	- 12	.29	- 12	.07	-175
100	.13	-151	2.62	- 26	.29	- 25	.08	-167
200	.20	-157	2.60	- 52	.28	- 52	.11	-170
300	.25	-176	2.59	- 79	.27	- 79	.13	176
400	.27	163	2.59	-106	.26	-107	.11	155
500	.26	141	2.58	-136	.25	-137	.07	148
600	.24	117	2.53	-167	.25	-170	.06	140

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RF AMPLIFIER

MODEL *TM6572*

Available as: TM6572, 4 Pin TO-8 (T4)
 TN6572-3, 4 Pin Surface Mount (SM3)
 FP6572-4, 4 Pin Flatpack (FP4)
 BX6572, Connectorized Housing (H1)

Features

- High Efficiency: +13 dBm Typ. @ 150 mW DC
- Low Voltage: +5 volt Bias
- Operating Temp. -55 °C to +85 °C

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Specifications

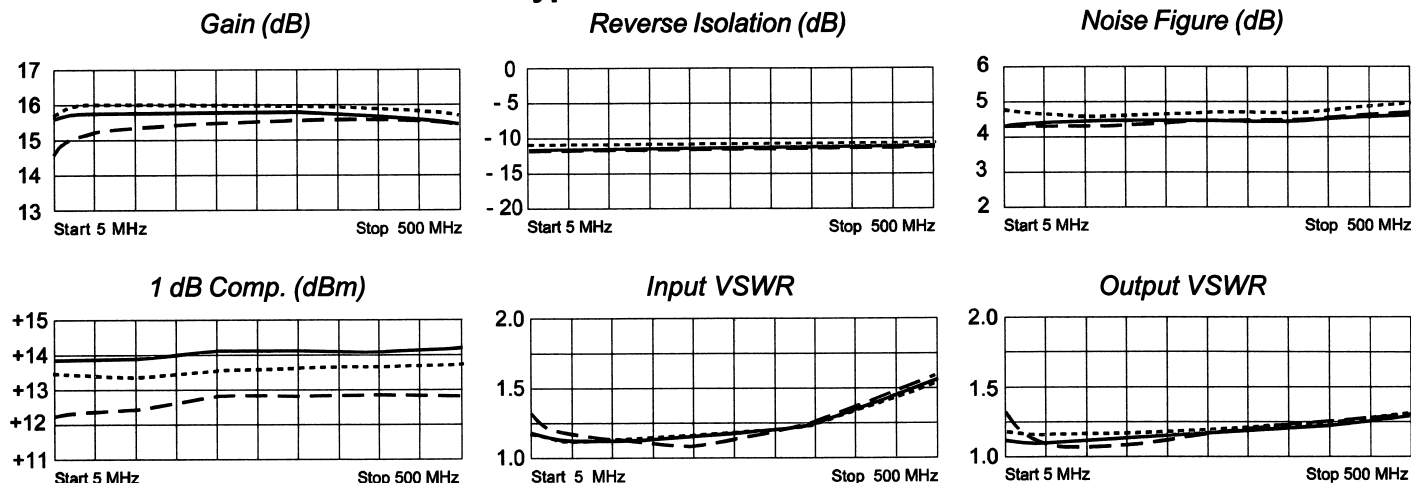
CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 500 MHz	5 - 500 MHz
Gain (dB)		14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)		+13	+11 Min.
Reverse Isolation (dB)		- 18	- 16 Max.
VSWR	In	<1.25:1	2.0:1 Max.
	Out	<1.25:1	2.0:1 Max.
Noise figure (dB)		<4	5.5 Max.
Power	Vdc	+5	+5
	mA	30	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

Freq MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.10	-137	5.40	-173	.11	-8	.09	145
50	.09	178	5.48	172	.12	1	.05	179
100	.08	175	5.48	163	.12	1	.05	-170
200	.08	171	5.48	146	.12	2	.08	-162
300	.07	168	5.47	129	.13	1	.10	-164
400	.06	-180	5.47	111	.13	1	.14	179
500	.08	-165	5.46	93	.14	-1	.18	163

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RF AMPLIFIER

MODEL *TM6573*

Available as: TM6573, 4 Pin TO-8 (T4)
 TN6573, 4 Pin Surface Mount (SM3)
 FP6573, 4 Pin Flatpack (FP4)
 BX6573, Connectorized Housing (H1)

Features

- High Gain: 32 dB Typical
- Low Noise Figure: 2.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	32	29 Min.
Power @ 1 dB Comp. (dBm)	+2.0	- 2.5 Min.
Reverse Isolation (dB)	- 39.5	- 38 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	20	25 Max.

Note: Care should always be taken to effectively ground the case of each unit.

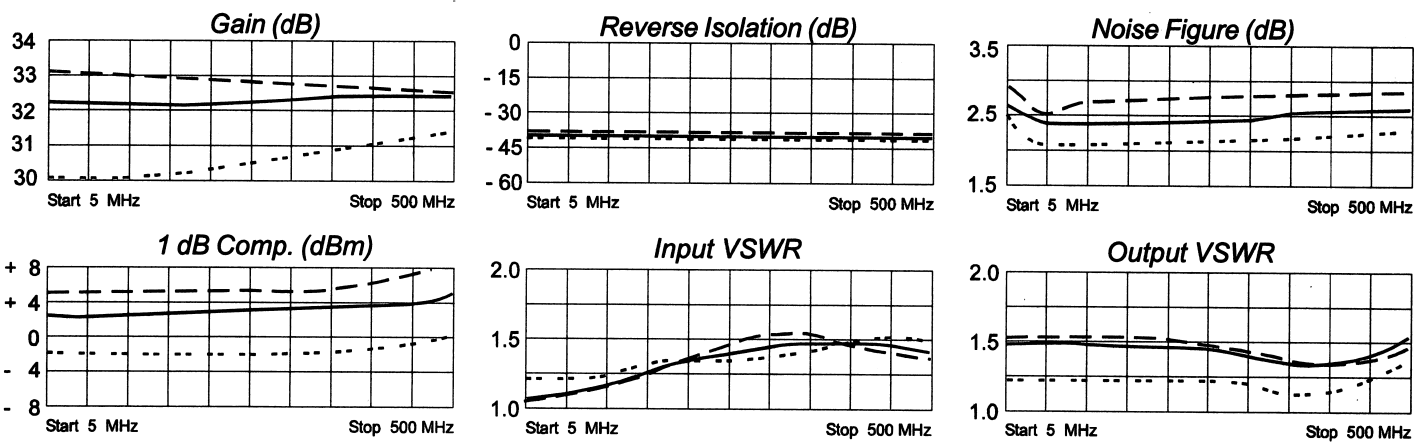
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +25 (Typ.)
 Second Order Two Tone Intercept Point +19 (Typ.)
 Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.02	-115	43.29	2	.01	- 8	.20	-174
50	.05	-112	43.04	- 20	.01	- 7	.20	173
100	.09	-121	43.06	- 39	.01	- 3	.19	164
200	.15	-142	43.16	- 78	.01	-12	.19	145
300	.20	-162	43.89	-118	.01	- 1	.17	130
400	.21	-179	44.11	-160	.01	-17	.14	129
500	.20	169	43.91	156	.01	-19	.19	141
600	.21	173	43.44	108	.01	-21	.36	130



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RF AMPLIFIER

MODEL *TM6574*

Available as: TM6574, 4 Pin TO-8 (T4)
 TN6574, 4 Pin Surface Mount (SM3)
 FP6574, 4 Pin Flatpack (FP4)
 BX6574, Connectorized Housing (H1)

Features

- High Gain: 30 dB Typ.
- Medium Output Power: +9 dBm Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	30	27 Min.
Power @ 1 dB Comp. (dBm)	+9	+7 Min.
Reverse Isolation (dB)	- 36	- 33 Max.
VSWR In	1.35:1	2.0:1 Max.
Out	1.65:1	2.0:1 Max.
Noise figure (dB)	3.5	6.0 Max.
Power Vdc	+15	+15
mA	37	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

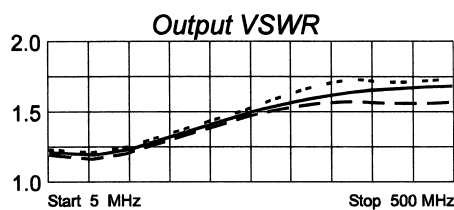
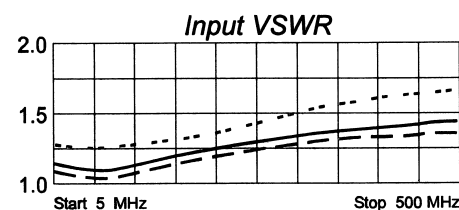
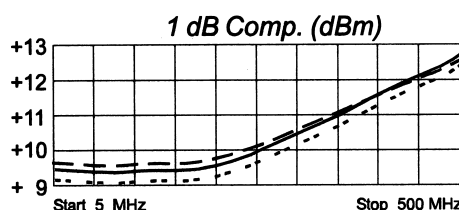
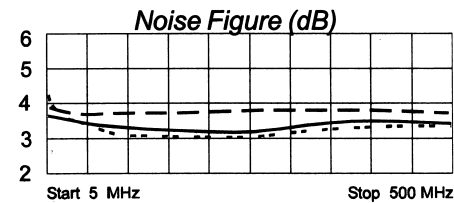
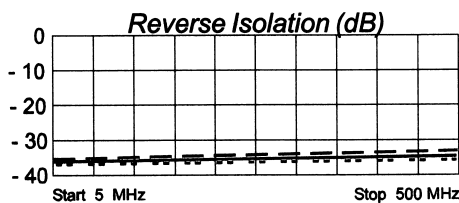
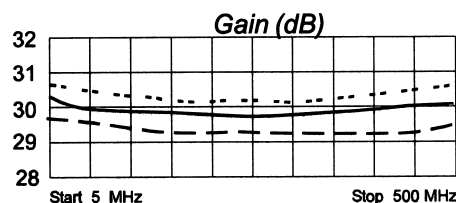
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +36 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.06	-148	32.67	3	.01	7	.07	-162
50	.06	163	31.75	- 21	.01	2	.08	-165
100	.07	147	31.43	- 41	.01	6	.11	-162
200	.11	112	31.15	- 82	.01	14	.17	-176
300	.15	85	31.19	-123	.01	13	.23	163
400	.19	61	31.59	-166	.02	- 3	.26	140
500	.21	39	32.23	149	.02	-11	.26	123

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RF AMPLIFIER

MODEL *TM6575*

Available as: TM6575, 4 Pin TO-8 (T4)
 TN6575, 4 Pin Surface Mount (SM3)
 FP6575, 4 Pin Flatpack (FP4)
 BX6575, Connectorized Housing (H1)

Features

- High Gain: +21 dB Typical
- Low Noise: 2.7 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	21	19 Min.
Power @ 1 dB Comp. (dBm)	+ 9.5	+ 8.5 Min.
Reverse Isolation (dB)	- 23	- 21 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.7	3.5 Max.
Power Vdc	+15	+15
mA	23	27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

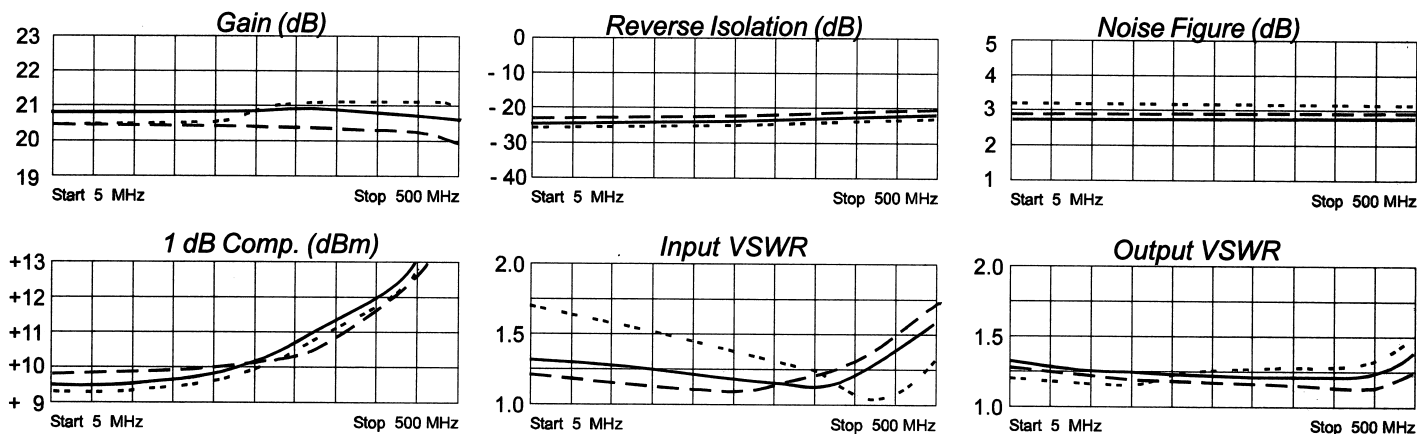
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.16	-174	10.41	-177	.05	5	.14	-174
50	.15	163	10.37	168	.05	1	.13	167
100	.14	145	10.35	155	.05	1	.12	152
200	.11	108	10.36	129	.06	1	.11	122
300	.06	46	10.43	103	.06	0	.09	95
400	.09	-69	10.57	73	.07	-3	.11	74
500	.23	-129	10.17	38	.08	-9	.18	41

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RF AMPLIFIER

MODEL *TM6576*

Available as: TM6576, 4 Pin TO-8 (T4)
 TN6576, 4 Pin Surface Mount (SM3)
 FP6576, 4 Pin Flatpack (FP4)
 BX6576, Connectorized Housing (H1)

Features

- High Gain: 28 dB Typical
- High Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	28	26.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+14 Min.
Reverse Isolation (dB)	- 34	- 33 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.0	6.0 Max.
Power Vdc	+15	+15
mA	64	68 Max.

Note: Care should always be taken to effectively ground the case of each unit.

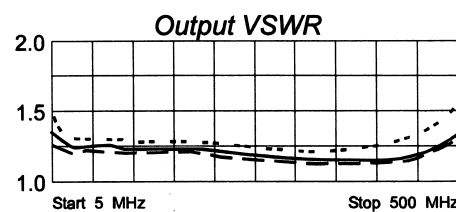
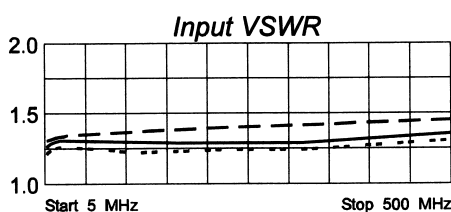
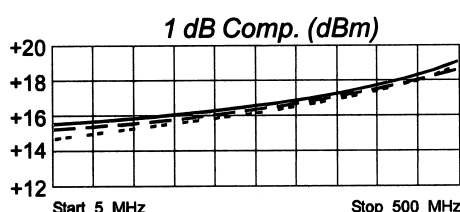
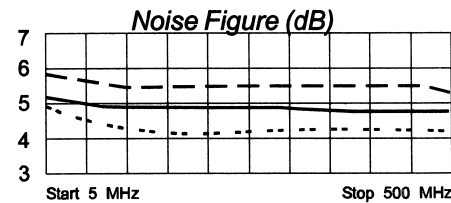
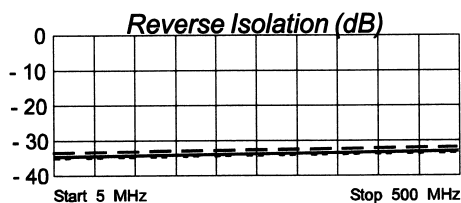
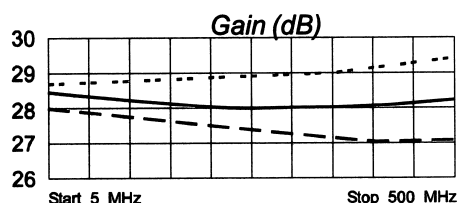
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +56 (Typ.)
 Second Order Two Tone Intercept Point +52 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	10	26.16	9	.01	8	.14	57
50	.12	- 3	25.78	- 20	.01	-7	.11	- 2
100	.12	- 5	25.66	- 41	.01	6	.11	- 18
200	.12	- 8	25.56	- 82	.01	8	.09	- 44
300	.13	-19	25.65	-123	.02	2	.08	- 83
400	.15	-35	25.76	-166	.02	9	.09	-136
500	.17	-66	26.10	149	.02	-1	.17	169

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RF AMPLIFIER

MODEL *TM6577*

Available as: TM6577, 4 Pin TO-8 (T4)
 TN6577, 4 Pin Surface Mount (SM3)
 FP6577, 4 Pin Flatpack (FP4)
 BX6577, Connectorized Housing (H1)

Features

- High Gain: 16.5 dB Typical
- Medium Output Power: +17 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+17	+15.0 Min.
Reverse Isolation (dB)	- 18.5	- 17 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.5	5.5 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

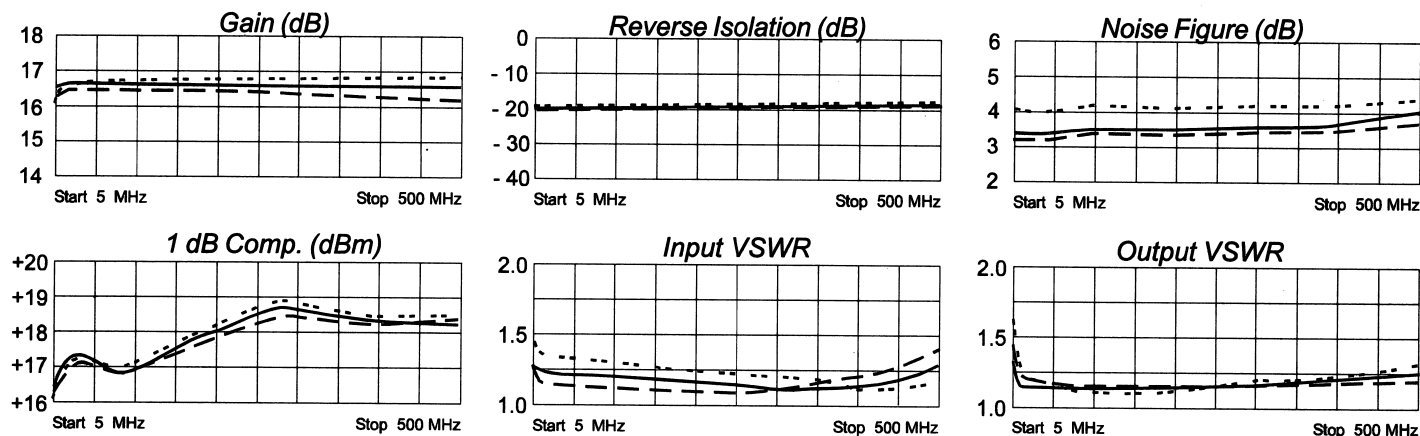
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	-121	6.73	-170	.09	11	.15	136
50	.09	-180	6.90	171	.10	-0	.06	161
100	.08	170	6.88	159	.09	-1	.05	170
200	.07	161	6.85	138	.10	-2	.05	171
300	.05	170	6.79	117	.10	-4	.07	162
400	.07	-164	6.79	94	.11	-8	.09	148
500	.13	-158	6.71	70	.12	-12	.12	122

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RF AMPLIFIER

MODEL *TM6581*

Available as: TM6581, 4 Pin TO-8 (T4)
 TN6581, 4 Pin Surface Mount (SM3)
 FP6581, 4 Pin Flatpack (FP4)
 BX6581, Connectorized Housing (H1)

Features

- High Gain: >22 dB Typical
- Low Noise Figure: <3.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 500 MHz	20 - 500 MHz
Gain (dB)	22	21.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+13.5 Min.
Reverse Isolation (dB)	- 29	- 28 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+15	+15
mA	27	30 Max.

Note: Care should always be taken to effectively ground the case of each unit.

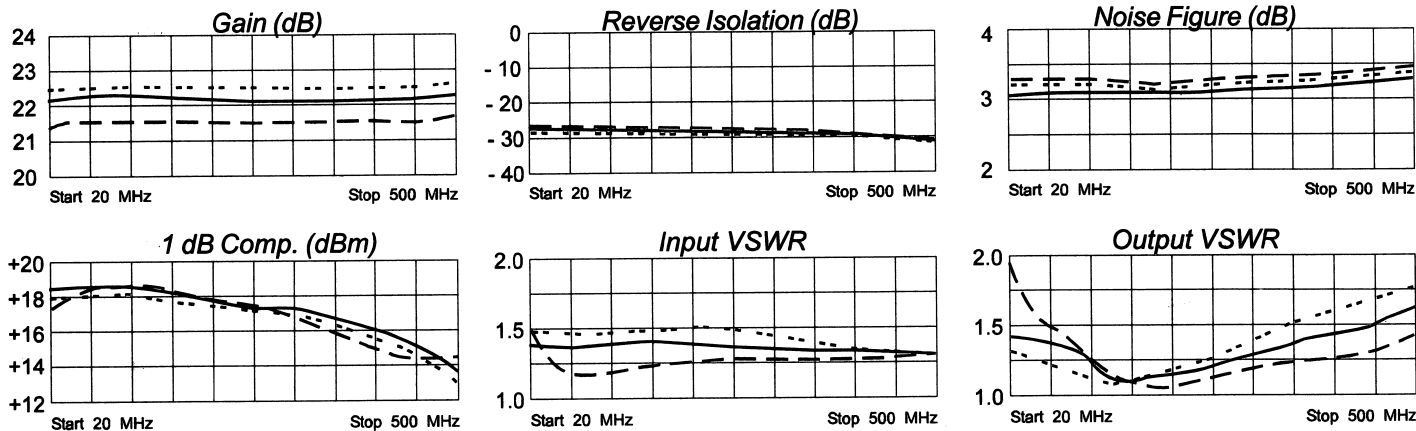
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.20	-125	12.73	-168	.04	3	.19	167
20	.16	-154	12.87	-180	.04	- 2	.18	167
50	.14	169	12.98	163	.04	- 7	.16	159
100	.15	132	12.96	141	.04	- 16	.12	147
200	.16	79	12.91	99	.04	- 40	.06	-175
300	.16	32	12.79	56	.04	- 66	.13	-173
400	.15	- 16	12.80	9	.03	- 96	.18	130
500	.15	- 90	12.93	- 43	.03	-131	.23	50
600	.31	153	12.99	-112	.02	172	.32	6

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RF AMPLIFIER

MODEL *TM6582*

Available as: TM6582, 4 Pin TO-8 (T4)
 TN6582, 4 Pin Surface Mount (SM3)
 FP6582, 4 Pin Flatpack (FP4)
 BX6582, Connectorized Housing (H1)

Features

- Low Noise Figure: 3.5 dB Typical
- High Output Power: +21 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 500 MHz	30 - 500 MHz
Gain (dB)	23	21.5 Min.
Power @ 1 dB Comp. (dBm)	+21	+17.0 Min.
Reverse Isolation (dB)	- 29	- 27 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.25:1	2.0:1 Max.
Noise figure (dB)	3.5	4.5 Max.
Power Vdc	+15	+15
mA	47	52 Max.

Note: Care should always be taken to effectively ground the case of each unit.

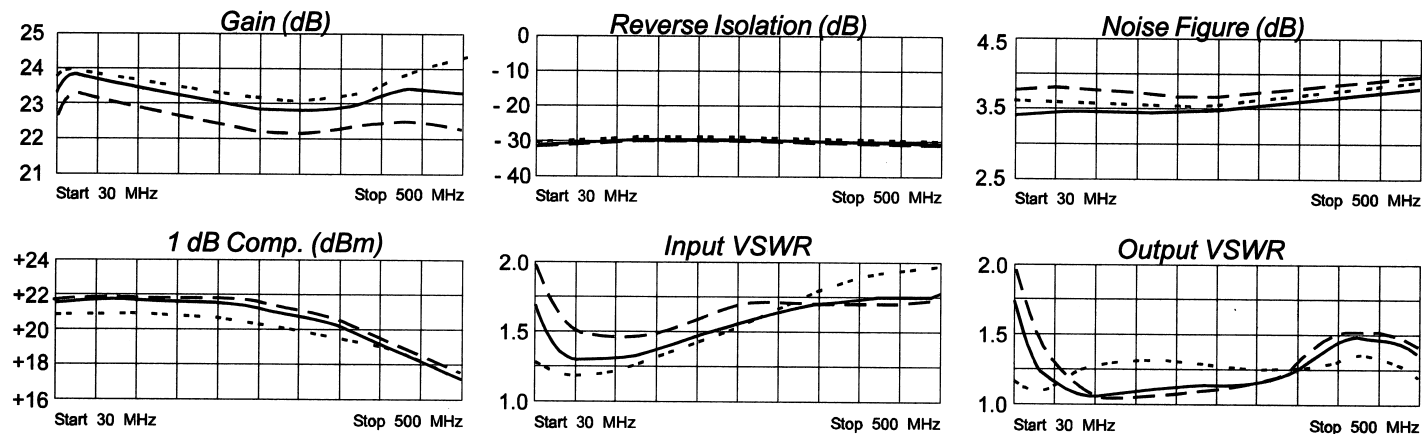
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.36	- 52	13.26	-158	.03	25	.42	120
50	.19	- 57	14.65	165	.03	5	.15	100
100	.16	- 56	14.61	130	.03	- 19	.03	135
200	.20	- 74	13.87	70	.03	- 43	.09	-166
300	.26	-104	13.54	13	.03	- 74	.08	137
400	.29	-144	13.99	- 50	.03	-114	.10	8
500	.29	136	14.49	-129	.03	-174	.10	- 50

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RF AMPLIFIER

MODEL *TM6583*

Available as: TM6583, 4 Pin TO-8 (T4)
 TN6583, 4 Pin Surface Mount (SM3)
 FP6583, 4 Pin Flatpack (FP4)
 BX6583, Connectorized Housing (H1)

Features

- High Gain: 30 dB Typical
- Low Power Drain: 65 mW @ 5 Volts
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	30	28.0 Min.
Power @ 1 dB Comp. (dBm)	-1	-4 Min.
Reverse Isolation (dB)	- 37.5	- 36 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	<2.3	3.0 Max.
Power Vdc	+5	+5
mA	13	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

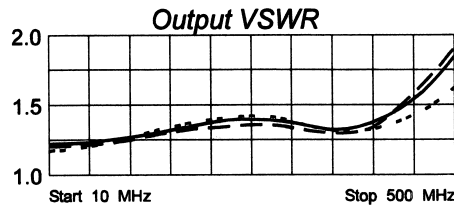
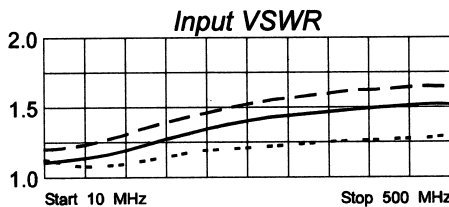
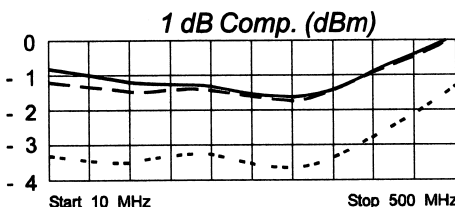
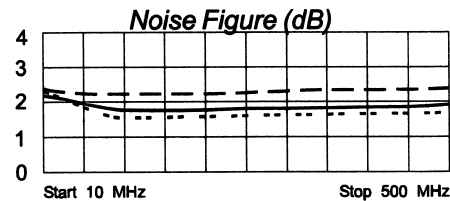
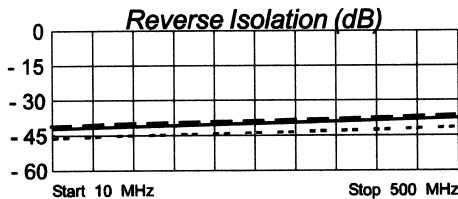
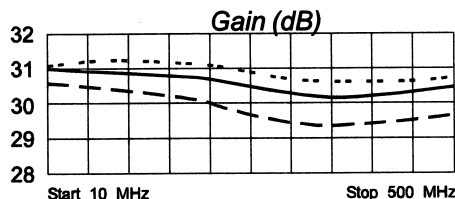
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +19 (Typ.)
 Second Order Two Tone Intercept Point +13 (Typ.)
 Third Order Two Tone Intercept Point +10 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power +6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.09	- 5	28.14	- 3	.01	2	.08	-169
50	.10	9	28.10	- 21	.01	14	.08	-171
100	.14	9	27.98	- 42	.01	8	.09	-166
200	.19	- 8	26.87	- 83	.01	15	.12	-173
300	.23	- 36	25.35	-120	.01	14	.12	-178
400	.26	- 68	25.86	-157	.01	12	.13	-158
500	.29	-108	27.37	160	.01	12	.31	-157

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RF AMPLIFIER

MODEL *TM6587*

Available as: TM6587, 4 Pin TO-8 (T4)
 TN6587, 4 Pin Surface Mount (SM3)
 FP6587, 4 Pin Flatpack (FP4)
 BX6587, Connectorized Housing (H1)

Features

- High Output Power: +17 dBm Typical
- High 3rd Order Intercept: +32 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	13	12 Min.
Power @ 1 dB Comp. (dBm)	+17	+16.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	1.75:1	2.0:1 Max.
Out	1.75:1	2.0:1 Max.
Noise figure (dB)	4.0	5.0 Max.
Power Vdc	+15	+15
mA	32	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

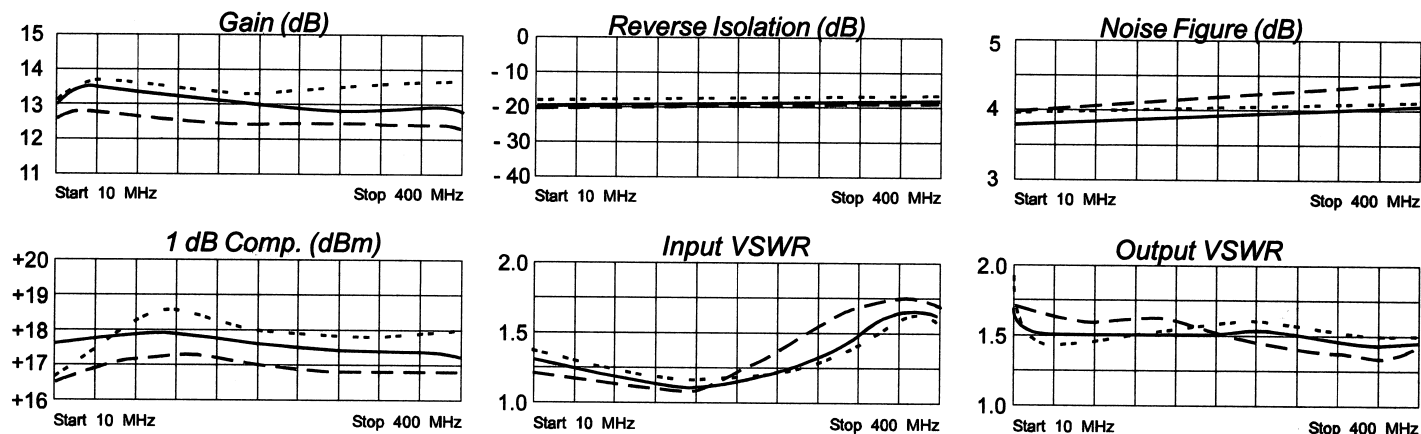
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +47 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	- 93	4.46	-167	.11	14	.24	156
10	.09	-110	4.54	-176	.12	6	.18	163
50	.05	-151	4.61	167	.12	- 3	.16	-174
100	.04	-145	4.60	151	.12	-10	.18	-162
200	.06	- 99	4.52	121	.12	-21	.25	-166
300	.15	- 99	4.51	90	.13	-34	.27	172
400	.26	-118	4.54	55	.13	-52	.21	118

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RF AMPLIFIER

MODEL *TM6588*

Available as: TM6588, 4 Pin TO-8 (T4)
 TN6588, 4 Pin Surface Mount (SM3)
 FP6588, 4 Pin Flatpack (FP4)
 BX6588, Connectorized Housing (H1)

Features

- High Gain: 18.5 dB Typical
- High Output Power: +21 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 450 MHz
Gain (dB)	18.5	17.5 Min.
Power @ 1 dB Comp. (dBm)	+21	+19 Min.
Reverse Isolation (dB)	- 20	- 17 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	7.0 Max.
Power Vdc	+15	+15
mA	80	87 Max.

Note: Care should always be taken to effectively ground the case of each unit.

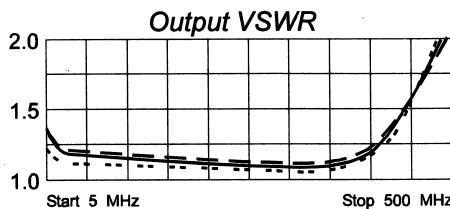
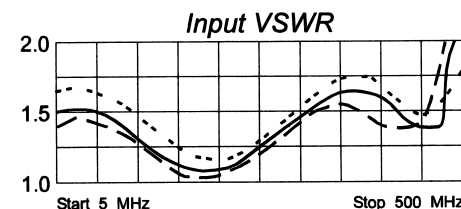
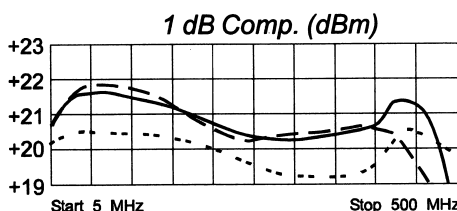
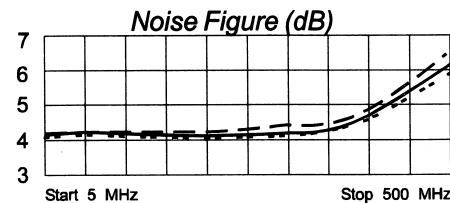
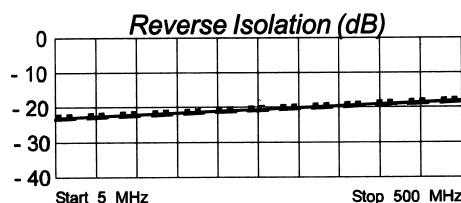
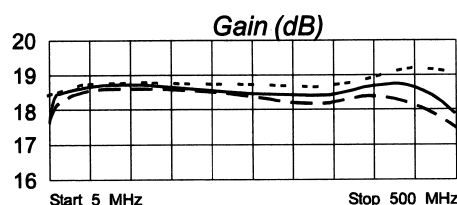
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.20	-150	7.94	-172	.07	9	.29	171
50	.20	166	8.39	161	.07	- 3	.22	166
100	.15	144	8.44	141	.08	- 8	.20	155
200	.03	- 1	8.45	99	.09	- 25	.12	127
300	.20	- 94	8.32	55	.10	- 46	.02	65
400	.23	-152	8.45	6	.12	- 74	.04	47
450	.15	135	8.62	- 24	.13	- 95	.21	28
500	.33	19	7.91	- 65	.14	-126	.52	- 8

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RF AMPLIFIER

MODEL *TR6589*

Available as: TR6589, 4 Pin Surface Mount (SM3)
 FP6589-4, 4 Pin Flatpack (FP4)
 BR6589, Connectorized Housing (H2)

Features

- High Gain: 26.5 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. -55 °C +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	26.5	25 Min.
Power @ 1 dB Comp. (dBm)	+22	+20 Min.
Reverse Isolation (dB)	- 33	- 31 Max.
VSWR In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	3.75	5.0 Max.
Power Vdc mA	+15 130	+15 135 Max.

Note: Care should always be taken to effectively ground the case of each unit.

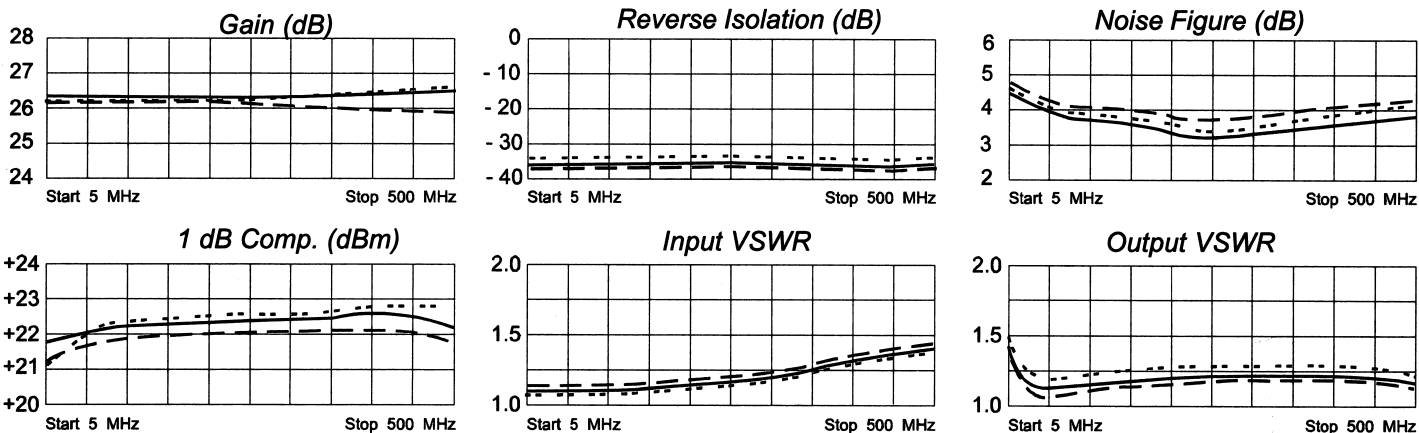
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +61 (Typ.)
 Second Order Two Tone Intercept Point +55 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.05	126	21.71	15	.01	19	.17	86
50	.02	66	20.95	-15	.02	-1	.03	-26
100	.04	63	20.84	-31	.02	7	.05	-73
200	.08	54	20.77	-62	.02	8	.09	-119
300	.11	34	20.83	-94	.02	4	.13	-149
400	.14	14	20.92	-126	.02	5	.14	-177
450	.16	-11	21.00	-159	.02	-2	.15	156

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RF AMPLIFIER

MODEL *TM6603*

Available as: TM6603, 4 Pin TO-8 (T4)
 TN6603, 4 Pin Surface Mount (SM3)
 FP6603, 4 Pin Flatpack (FP4)
 BX6603, Connectorized Housing (H1)

Features

- 24 Volt Operation
- Medium Output Power: +15.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+14.0 Min.
Reverse Isolation (dB)	- 15.5	- 14 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	5.5	7.0 Max.
Power Vdc	+24	+24
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

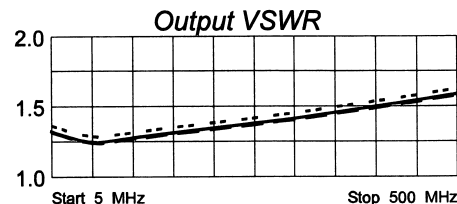
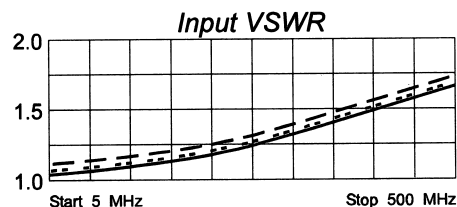
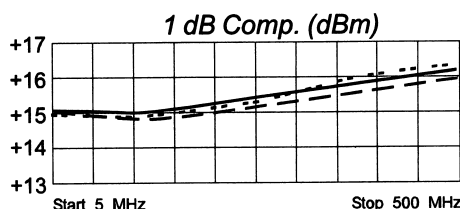
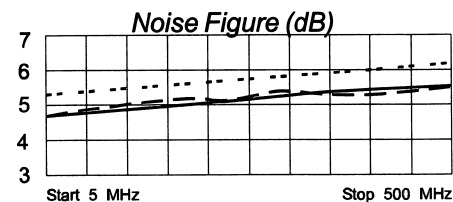
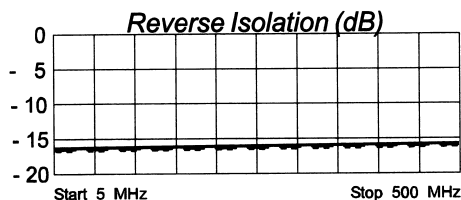
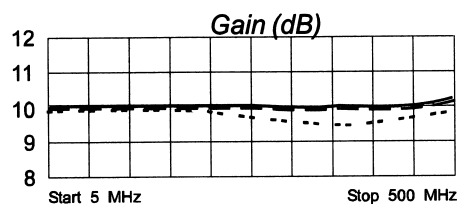
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 26 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.02	- 72	3.20	-178	.14	4	.13	-164
50	.02	- 87	3.30	172	.14	1	.13	-176
100	.04	- 89	3.19	164	.14	0	.13	-174
200	.09	-107	3.19	148	.15	-0	.15	-170
300	.14	-120	3.18	132	.15	-1	.17	-169
400	.19	-132	3.21	116	.16	-2	.20	-174
500	.26	-145	3.24	100	.17	-2	.23	-180

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RF AMPLIFIER

MODEL *TM6605*

Available as: TM6605, 4 Pin TO-8 (T4)
 TN6605, 4 Pin Surface Mount (SM3)
 FP6605, 4 Pin Flatpack (FP4)
 BX6605, Connectorized Housing (H1)

Features

- Medium Gain: 15.5 dB Typical
- Medium Output Power: +10 dBm
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 600 MHz	10 - 600 MHz
Gain (dB)	15.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+8.0 Min.
Reverse Isolation (dB)	- 18.5	- 17 Max.
VSWR In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	<3.0	4.5 Max.
Power Vdc mA	+15 24	+15 27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

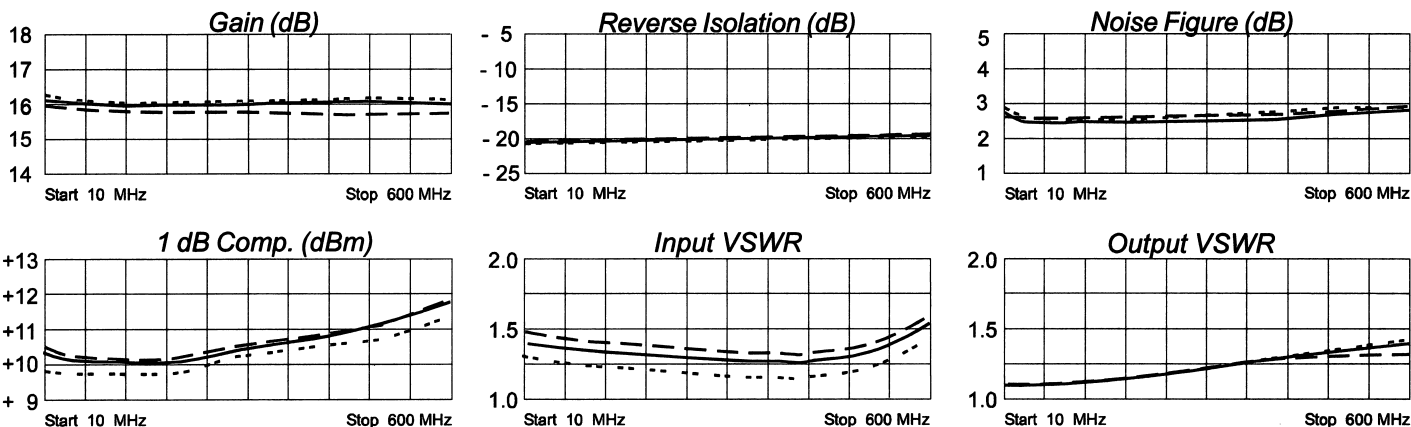
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.14	-3	6.42	179	.09	0	.03	1
50	.13	-9	6.32	170	.09	-2	.04	-28
100	.13	-15	6.29	161	.09	-2	.04	-56
200	.12	-33	6.29	141	.09	-5	.07	-91
300	.11	-60	6.29	122	.10	-8	.09	-121
400	.10	-100	6.32	102	.10	-13	.12	-146
500	.14	-146	6.35	81	.11	-17	.15	-178
600	.22	175	6.31	59	.11	-25	.18	150

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RF AMPLIFIER

MODEL *TM6607*

Available as: TM6607, 4 Pin TO-8 (T4)
 TN6607, 4 Pin Surface Mount (SM3)
 FP6607, 4 Pin Flatpack (FP4)
 BX6607, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Typical
- Medium Output Power: +14.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+14.5	+12.5 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	<5.0	6.0 Max.
Power Vdc	+24	+24
mA	50	54 Max.

Note: Care should always be taken to effectively ground the case of each unit.

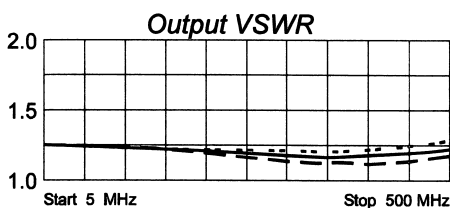
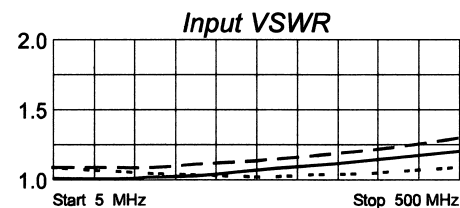
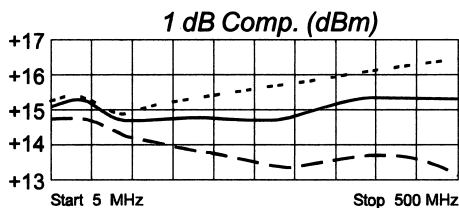
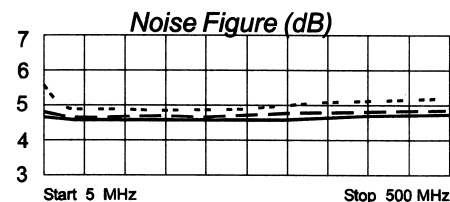
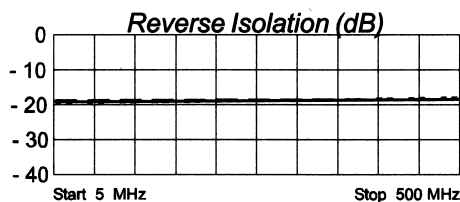
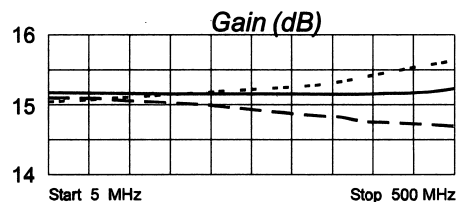
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +34 (Typ.)
 Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 26 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	-147	5.74	-178	.09	-168	.09	109
50	.02	177	5.74	171	.10	177	.09	108
100	.02	179	5.74	161	.09	170	.12	88
200	.00	-128	5.71	143	.10	158	.19	65
300	.03	- 83	5.70	124	.10	135	.30	34
400	.05	-100	5.73	104	.10	114	.35	4
500	.10	-118	5.75	84	.11	92	.28	- 30
600	.14	-138	5.74	62	.11	66	.09	- 75

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RF AMPLIFIER

MODEL *TM6609*

Available as: TM6609, 4 Pin TO-8 (T4)
 TN6609, 4 Pin Surface Mount (SM3)
 FP6609, 4 Pin Flatpack (FP4)
 BX6609, Connectorized Housing (H1)

Features

- Medium Gain: 11.5 dB Typical
- High Output Power: +22 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.5	7.0 Max.
Power Vdc	+24	+24
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

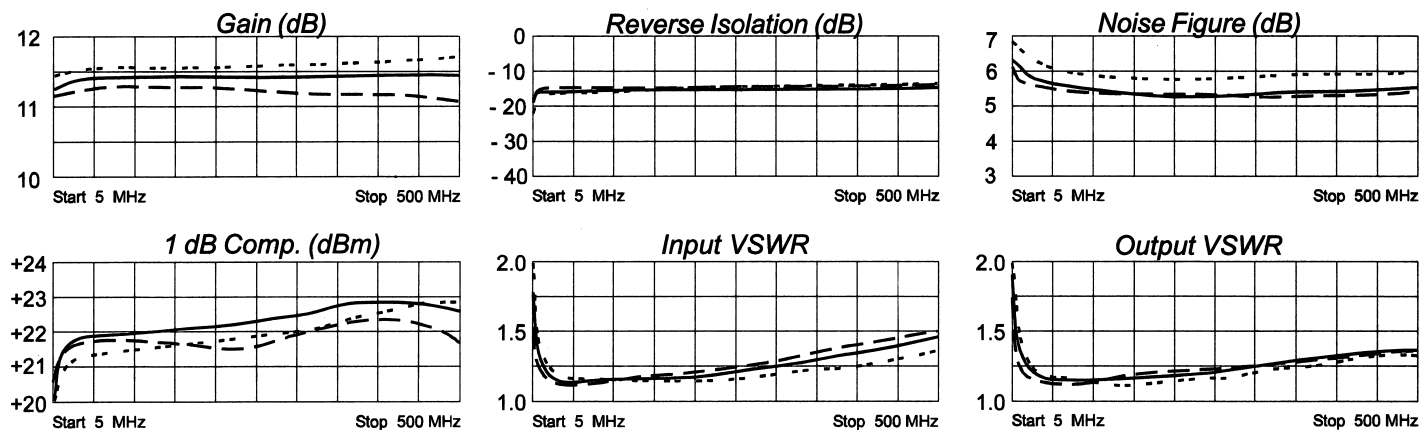
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 27 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.31	- 51	3.70	-154	.12	32	.39	113
50	.05	-112	3.65	175	.16	2	.07	110
100	.06	-121	3.66	166	.16	- 1	.07	102
200	.08	-121	3.66	149	.16	- 2	.09	81
300	.11	-127	3.65	133	.17	- 5	.11	71
400	.15	-134	3.67	117	.17	- 8	.14	59
500	.19	-142	3.66	101	.17	-12	.16	49

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RF AMPLIFIER

MODEL *TM6654*

Available as: TM6654, 4 Pin TO-8 (T4)
 TN6654, 4 Pin Surface Mount (SM3)
 FP6654, 4 Pin Flatpack (FP4)
 BX6654, Connectorized Housing (H1)

Features

- High Gain : 29 dB Typical
- Low Noise Figure: < 2.5 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	29	27.5 Min.
Power @ 1 dB Comp. (dBm)	+11	+10.0 Min.
Reverse Isolation (dB)	- 34.5	- 33 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+5	+5
mA	40	45 Max.

Note: Care should always be taken to effectively ground the case of each unit.

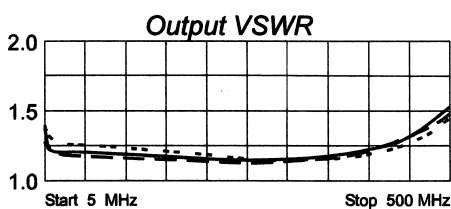
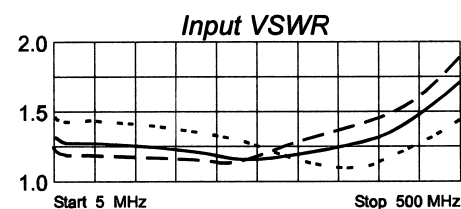
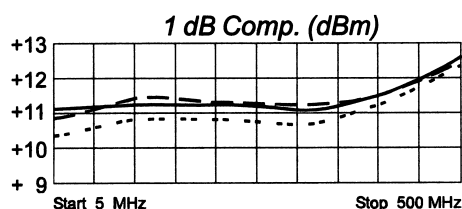
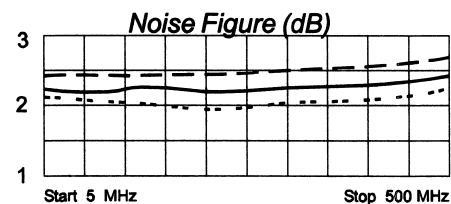
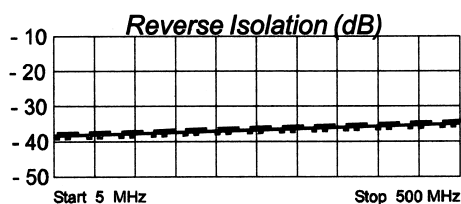
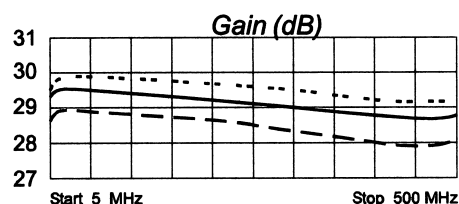
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	175	28.91	11	.01	13	.13	134
50	.12	161	29.63	- 21	.01	6	.09	176
100	.11	141	29.48	- 43	.01	- 3	.08	180
200	.09	92	28.91	- 83	.01	2	.07	166
300	.07	12	27.94	-131	.01	- 4	.07	142
400	.13	- 66	27.11	-175	.01	- 9	.09	111
500	.27	-115	27.29	137	.02	- 21	.21	77
								41

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RF AMPLIFIER

MODEL *TM6659*

Available as: TM6659, 4 Pin TO-8 (T4)
 TN6659, 4 Pin Surface Mount (SM3)
 FP6659, 4 Pin Flatpack (FP4)
 BX6659, Connectorized Housing (H1)

Features

- High Output Power: +22 dBm Typical
- High Third Order Intercept: +36 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 800 MHz	10 - 700 MHz
Gain (dB)	10.5	9.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 14	- 13 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	6.5	8.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

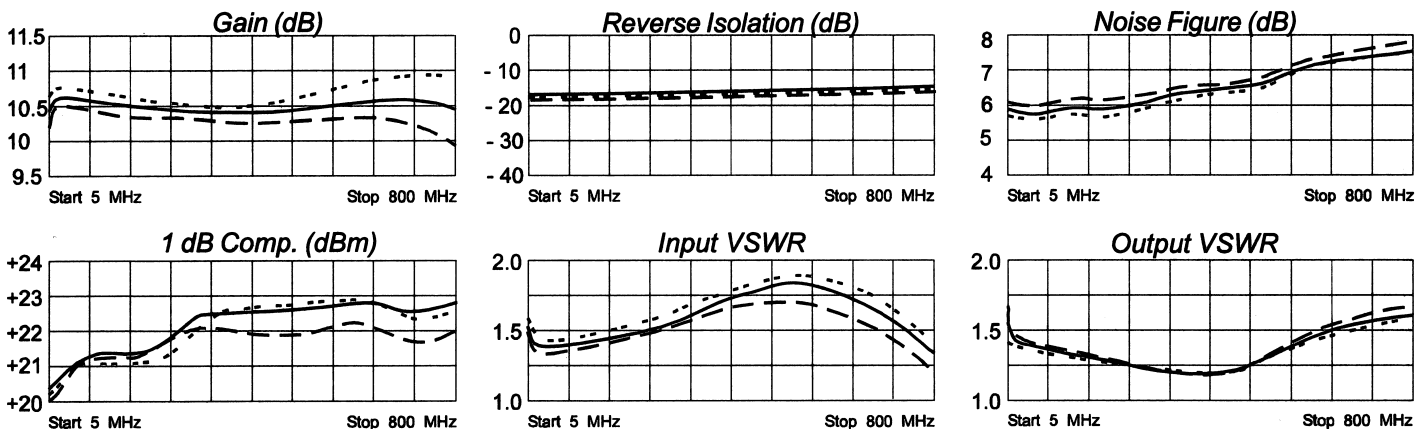
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	-131	3.33	-165	.15	11	.21	161
50	.17	162	3.41	170	.15	- 1	.17	159
100	.18	139	3.38	158	.16	- 0	.16	145
200	.20	103	3.34	136	.17	- 4	.13	112
300	.23	74	3.32	115	.18	- 9	.11	69
400	.24	51	3.34	94	.19	-16	.10	18
500	.23	30	3.36	72	.19	-23	.12	- 33
600	.20	6	3.41	49	.20	-31	.18	- 74
700	.13	- 25	3.40	25	.19	-39	.23	-105
800	.05	-103	3.31	- 1	.19	-46	.28	-135

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RF AMPLIFIER

MODEL *TM6667*

Available as: TM6667, 4 Pin TO-8 (T4)
 TN6667, 4 Pin Surface Mount (SM3)
 FP6667, 4 Pin Flatpack (FP4)
 BX6667, Connectorized Housing (H1)

Features

- High Efficiency: +15 dBm Typ. @ 480 mW DC
- Low Noise Figure: < 4.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 700 MHz	5 - 600 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+15	+14.0 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+15	+15
mA	33	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

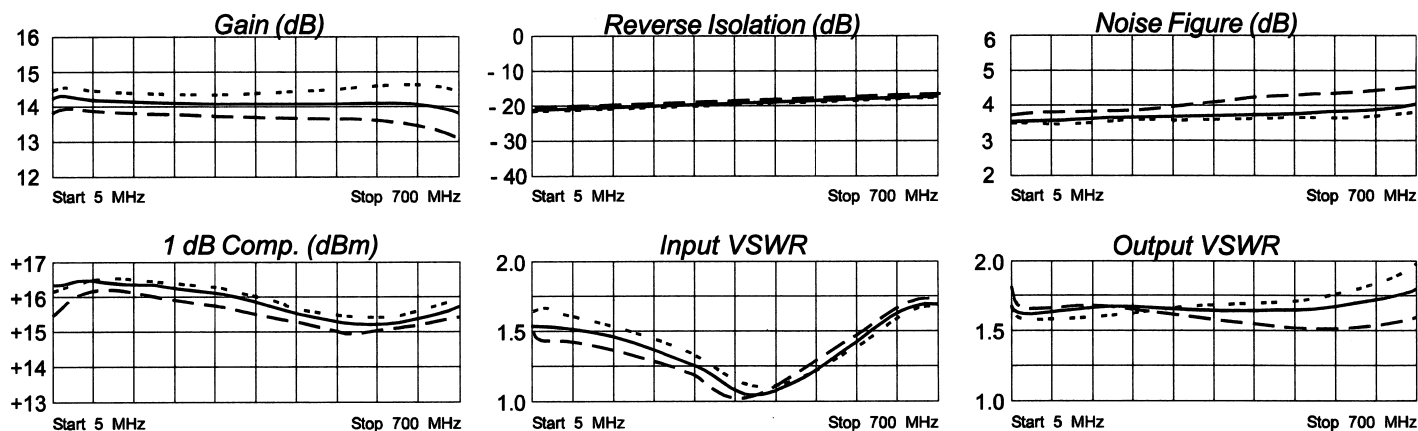
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.23	-163	5.16	-175	.09	6	.25	179
50	.22	173	5.19	168	.09	- 1	.24	176
100	.21	165	5.16	155	.09	- 4	.24	173
200	.16	149	5.09	129	.10	- 9	.25	166
300	.10	130	5.04	104	.11	-15	.25	155
400	.02	50	5.06	77	.11	-22	.25	139
500	.11	- 53	5.05	49	.12	-33	.25	120
600	.21	- 75	5.01	19	.13	-44	.27	92
700	.28	- 94	4.86	- 16	.14	-58	.34	53

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RF AMPLIFIER

MODEL **TM6670**

Available as: TM6670, 4 Pin TO-8 (T4)
 TN6670, 4 Pin Surface Mount (SM3)
 FP6670, 4 Pin Flatpack (FP4)
 BX6670, Connectorized Housing (H1)

Features

- Low Noise Figure: 1.8 dB Typical
- High Output Power: > +20 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	8.0	6.0 Min.
Power @ 1 dB Comp. (dBm)	>+20	+18.0 Min.
Reverse Isolation (dB)	- 11	- 10 Max.
VSWR In	<1.5:1	2.5:1 Max.
VSWR Out	<1.5:1	2.5:1 Max.
Noise figure (dB)	1.8	3.0 Max.
Power Vdc	+15	+15
mA	25	30 Max.

Note: Care should always be taken to effectively ground the case of each unit.

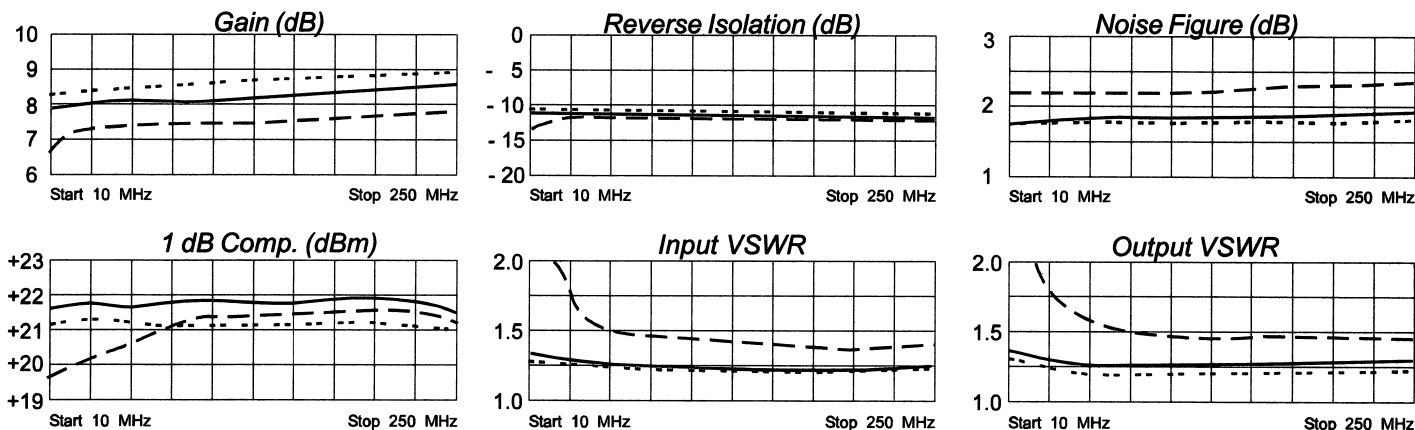
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.19	138	2.48	17	.28	18	.21	141
10	.12	146	2.56	8	.29	8	.13	144
20	.09	160	2.58	1	.29	2	.10	159
50	.08	-179	2.60	- 7	.29	- 7	.08	173
100	.11	-164	2.60	-18	.29	-17	.08	-171
150	.14	-164	2.62	-27	.28	-27	.09	-160
200	.19	-167	2.64	-37	.27	-37	.11	-149
250	.25	-175	2.67	-48	.26	-47	.16	-149
300	.32	177	2.67	-59	.25	-58	.21	-152

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RF AMPLIFIER

MODEL *TM6672*

Available as: TM6672, 4 Pin TO-8 (T4)
 TN6672, 4 Pin Surface Mount (SM3)
 FP6672, 4 Pin Flatpack (FP4)
 BX6672, Connectorized Housing (H1)

Features

- High Efficiency: +13 dBm Typ. @ 270 mW DC
- Low Noise Figure: < 4.5 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)	+13	+11.0 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	4.0	5.5 Max.
Power Vdc	+ 9	+ 9
mA	30	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

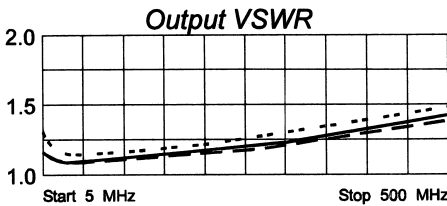
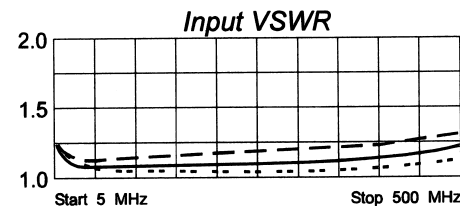
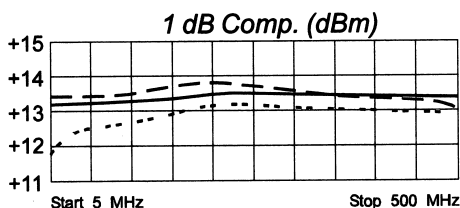
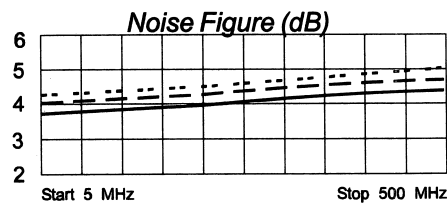
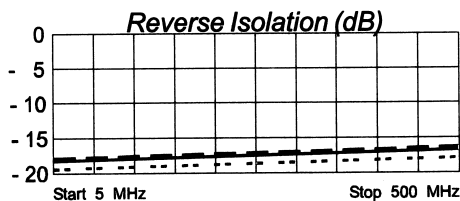
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 12 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.12	-129	5.57	-171	.11	10	.14	138
50	.09	170	5.68	172	.11	1	.06	163
100	.09	150	5.66	163	.11	- 1	.06	169
200	.10	119	5.63	146	.11	- 4	.05	167
300	.10	89	5.57	129	.12	- 7	.04	-177
400	.11	61	5.55	112	.12	-10	.04	-152
500	.11	34	5.54	94	.12	-14	.07	-145
600	.11	- 2	5.54	76	.12	-17	.09	-154

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RF AMPLIFIER

MODEL *TM6674*

Available as: TM6674, 4 Pin TO-8 (T4)
 TN6674, 4 Pin Surface Mount (SM3)
 FP6674, 4 Pin Flatpack (FP4)
 BX6674, Connectorized Housing (H1)

Features

- High Gain: 28 dB Typical
- Low DC Power: +65 mW @ 5V Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	28	26.0 Min.
Power @ 1 dB Comp. (dBm)	- 1.0	- 2.0 Min.
Reverse Isolation (dB)	- 39	- 37 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	<4.0 Max.
Power Vdc	+ 5	+ 5
mA	13	15 Max.

Note: Care should always be taken to effectively ground the case of each unit.

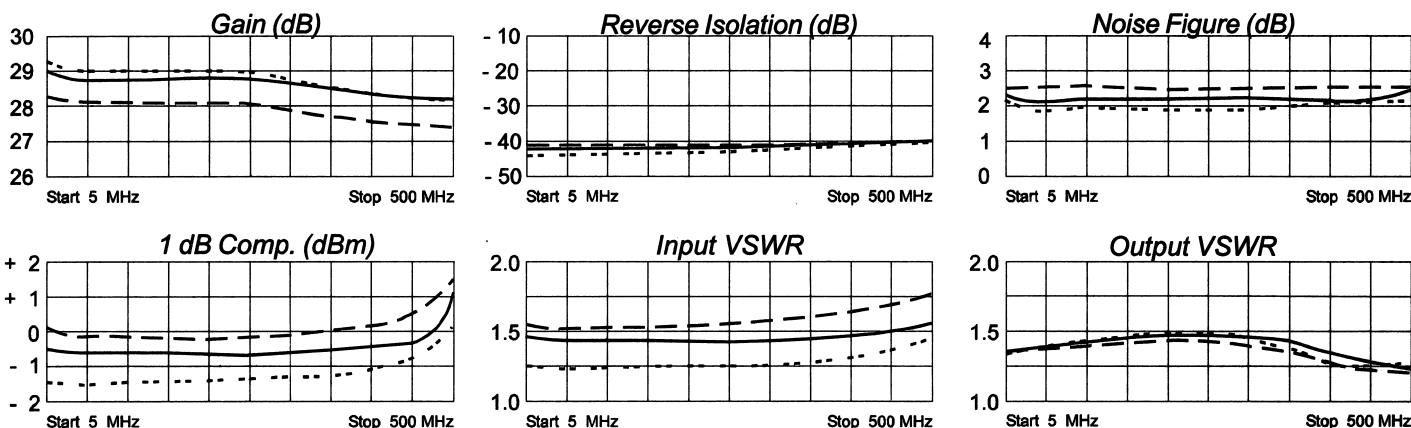
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +23 (Typ.)
 Second Order Two Tone Intercept Point +17 (Typ.)
 Third Order Two Tone Intercept Point + 9 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.21	- 7	27.22	3	.01	-14	.16	-169
50	.20	- 10	26.32	- 19	.01	7	.17	-175
100	.20	- 21	26.42	- 37	.01	-12	.17	-174
200	.20	- 39	26.34	- 74	.01	11	.17	-178
300	.21	- 61	25.78	-113	.01	-10	.18	-178
400	.23	- 83	25.76	-150	.01	16	.16	171
500	.25	-112	25.74	170	.01	4	.14	-177
600	.32	-135	26.01	130	.01	-41	.16	-177

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RF AMPLIFIER

MODEL *TM6675*

Available as: TM6675, 4 Pin TO-8 (T4)
 TN6675, 4 Pin Surface Mount (SM3)
 FP6675, 4 Pin Flatpack (FP4)
 BX6675, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- Low Noise Figure: <2.3 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	20.5	19.0 Min.
Power @ 1 dB Comp. (dBm)	+ 5	+ 4.0 Min.
Reverse Isolation (dB)	- 23.5	- 22.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.3	3.0 Max.
Power Vdc	+15	+15
mA	15	17 Max.

Note: Care should always be taken to effectively ground the case of each unit.

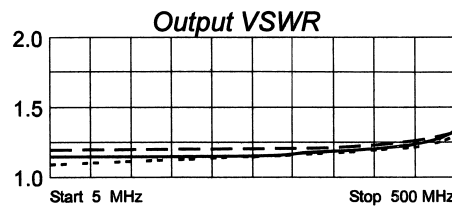
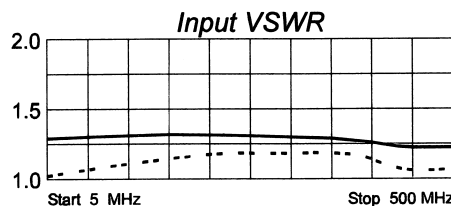
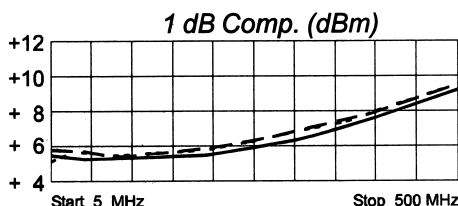
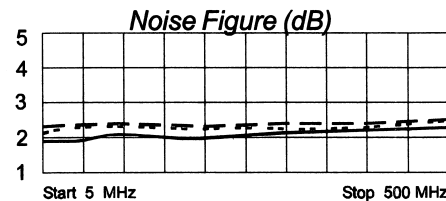
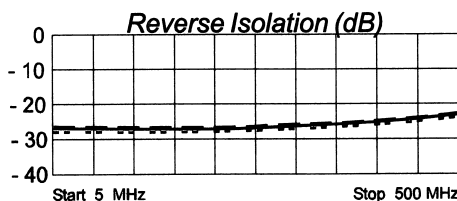
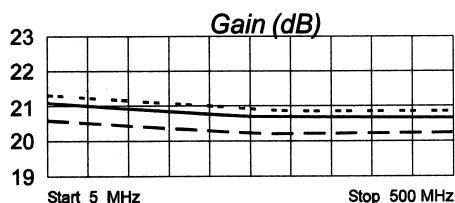
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +26 (Typ.)
 Second Order Two Tone Intercept Point +21 (Typ.)
 Third Order Two Tone Intercept Point +18 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	0	11.31	-179	.05	3	.07	- 5
50	.14	- 2	11.19	168	.05	- 2	.08	- 9
100	.15	- 5	11.09	156	.05	- 1	.08	- 22
200	.14	- 17	10.89	132	.05	- 5	.08	- 51
300	.13	- 32	10.71	109	.05	- 6	.07	- 92
400	.10	- 61	10.68	84	.06	-10	.08	-154
500	.08	-126	10.64	58	.06	-14	.15	148

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RF AMPLIFIER

MODEL *TM6677*

Available as: TM6677, 4 Pin TO-8 (T4)
TN6677-3, 4 Pin Surface Mount (SM3)
FP6677-4, 4 Pin Flatpack (FP4)
BX6677, Connectorized Housing (H1)

Features

- Medium Output Power: +16.5 dBm
- High Third Order I.P.: +30 dBm
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	5 - 600	5 - 600
Gain (dB)	16.5	14.5 Min.
Power @ 1 dB Comp. (dBm)	+16.5	+14.5 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	1.50:1	2.0:1 Max.
Out	1.50:1	2.0:1 Max.
Noise figure (dB)	5.0	7.0 Max.
Power Vdc	+15	+15
mA	50	56 Max.

Note: Care should always be taken to effectively ground the case of each unit.

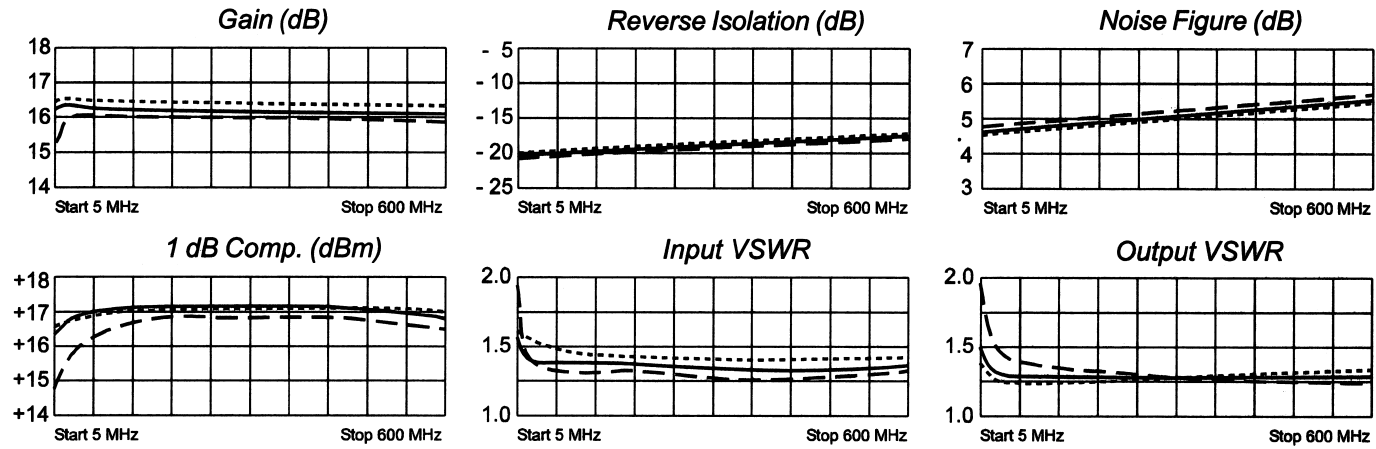
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
Second Order Two Tone Intercept Point +43 (Typ.)
Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C



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RF AMPLIFIER

MODEL *TM6681*

Available as: TM6681, 4 Pin TO-8 (T4)
 TN6681, 4 Pin Surface Mount (SM3)
 FP6681, 4 Pin Flatpack (FP4)
 BX6681, Connectorized Housing (H1)

Features

- High Reverse Isolation: -37 dB Typical
- Very Low Output VSWR: 1.1:1 Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	20 - 500 MHz
Gain (dB)	17.5	15.5 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+7.0 Min.
Reverse Isolation (dB)	- 37	- 35 Max.
VSWR In	1.40:1	2.00:1 Max.
Out	1.10:1	1.25:1 Max.
Noise figure (dB)	3.0	4.0 Max.
Power Vdc	+15	+15
mA	29	32 Max.

Note: Care should always be taken to effectively ground the case of each unit.

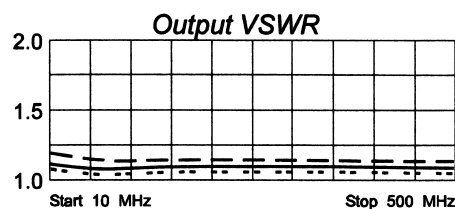
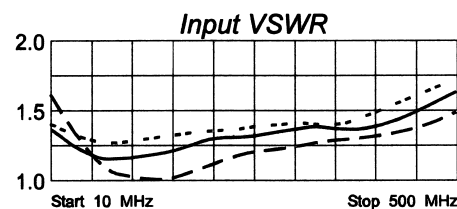
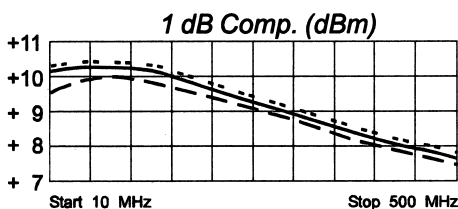
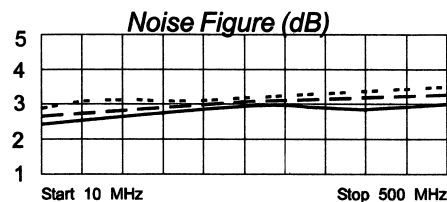
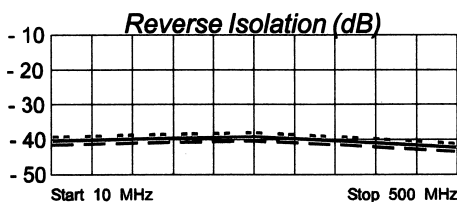
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.30	- 84	7.21	-156	.01	15	.03	165
50	.06	-161	7.55	164	.01	16	.03	167
100	.07	107	7.53	139	.01	- 19	.02	-179
200	.14	41	7.29	94	.01	- 19	.03	-111
300	.18	- 8	7.11	48	.01	- 32	.04	-126
400	.19	- 77	7.46	- 2	.01	- 60	.02	-114
500	.29	152	7.37	- 81	.01	-123	.03	-123

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RF AMPLIFIER

MODEL **TM6683**

Available as: TM6683, 4 Pin TO-8 (T4)
 TN6683, 4 Pin Surface Mount (SM3)
 FP6683, 4 Pin Flatpack (FP4)
 BX6683, Connectorized Housing (H1)

Features

- High Gain: 34 dB Typical
- Low Power Drain: 70 mW @ 5 Volts
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 250 MHz	10 - 250 MHz
Gain (dB)	34	32.5 Min.
Power @ 1 dB Comp. (dBm)	-1	-3 Min.
Reverse Isolation (dB)	- 47.5	- 45 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<2.0	3.0 Max.
Power Vdc	+5	+5
mA	14	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

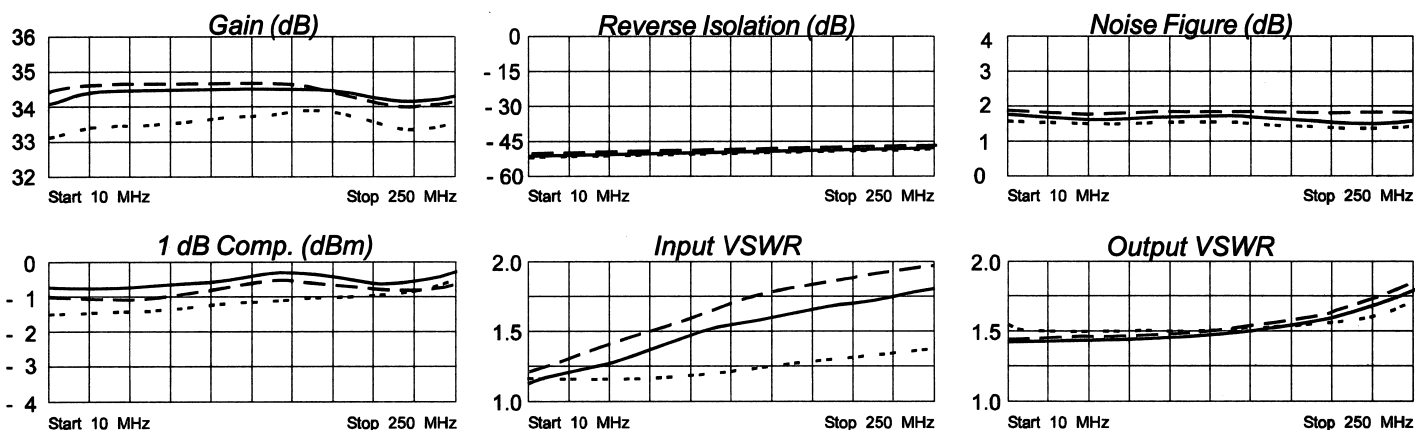
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +15 (Typ.)
 Second Order Two Tone Intercept Point + 9 (Typ.)
 Third Order Two Tone Intercept Point +10 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	134	24.54	- 7	.00	17	.18	- 7
50	.10	72	24.93	- 36	.00	-44	.18	- 27
100	.17	48	26.11	- 71	.00	64	.18	- 53
200	.26	12	28.09	-134	.00	28	.21	- 90
300	.31	- 20	29.12	-178	.01	9	.41	-125

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RF AMPLIFIER

MODEL *TM6719*

Available as: TM6719, 4 Pin TO-8 (T4)
 TN6719, 4 Pin Surface Mount (SM3)
 FP6719, 4 Pin Flatpack (FP4)
 BX6719, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.7 dB Typical
- Medium Output Power: > +9 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	33	31.0 Min.
Power @ 1 dB Comp. (dBm)	+9	+8.0 Min.
Reverse Isolation (dB)	- 42	- 40 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	1.7	2.0 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

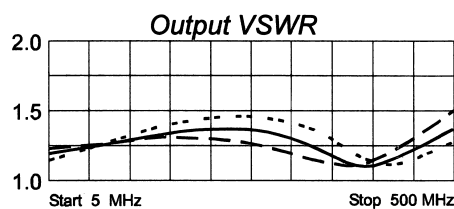
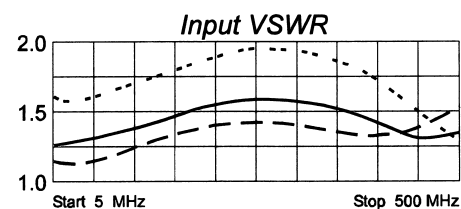
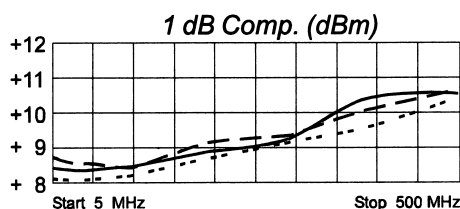
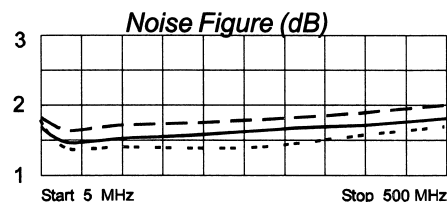
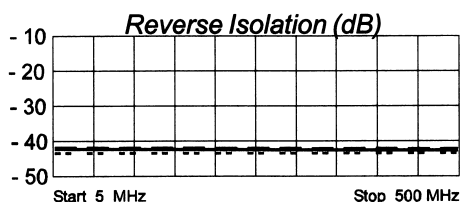
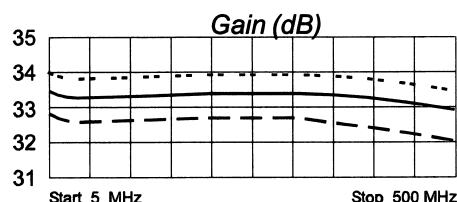
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +42 (Typ.)
 Second Order Two Tone Intercept Point +36 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-163	47.18	3	.01	12	.09	-163
50	.13	-166	46.15	-24	.01	-20	.10	-165
100	.16	-165	45.93	-48	.01	-5	.13	-164
200	.20	-173	46.18	-97	.01	-8	.16	179
300	.21	171	46.31	-147	.01	-16	.13	160
400	.17	165	46.10	160	.01	-25	.06	-171
500	.16	-158	44.77	104	.01	-41	.17	-148

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RF AMPLIFIER

MODEL *TM6721*

Available as: TM6721, 4 Pin TO-8 (T4)
TN6721, 4 Pin Surface Mount (SM3)
FP6721, 4 Pin Flatpack (FP4)
BX6721, Connectorized Housing (H1)

Features

- High Gain: 30 dB Typical
- Low Noise Figure: < 3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Gain (dB)	30	28.0 Min.
Power @ 1 dB Comp. (dBm)	+9	+7.5 Min.
Reverse Isolation (dB)	- 36	- 34 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	38	41 Max.

Note: Care should always be taken to effectively ground the case of each unit.

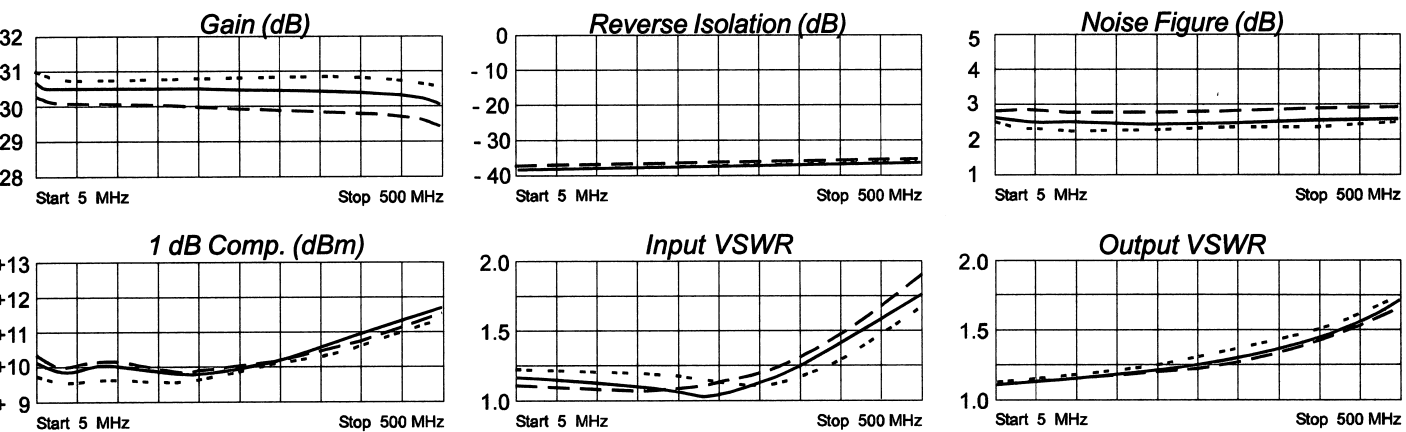
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
Second Order Two Tone Intercept Point +37 (Typ.)
Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 6 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.08	-163	34.22	3	.01	9	.06	-169
50	.07	165	33.49	-21	.01	-13	.06	-165
100	.06	151	33.32	-42	.01	-3	.08	-161
200	.02	138	33.35	-84	.01	-15	.10	-158
300	.06	-100	33.19	-128	.01	-13	.14	-162
400	.16	-130	32.86	-173	.01	-15	.19	-170
500	.29	-161	31.51	139	.01	-16	.27	172

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RF AMPLIFIER

MODEL *TM7101*

Available as: TM7101, 4 Pin TO-8 (T4)
 TN7101, 4 Pin Surface Mount (SM3)
 FP7101, 4 Pin Flatpack (FP4)
 BX7101, Connectorized Housing (H1)

Features

- Low Noise Figure: 1.8 dB Typical
- High Gain: 27.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 150 MHz	10 - 150 MHz
Gain (dB)	27.5	26.0 Min.
Power @ 1 dB Comp. (dBm)	+16.5	+15.0 Min.
Reverse Isolation (dB)	- 31.5	- 30 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	1.8	2.5 Max.
Power Vdc	+15	+15
mA	20	23 Max.

Note: Care should always be taken to effectively ground the case of each unit.

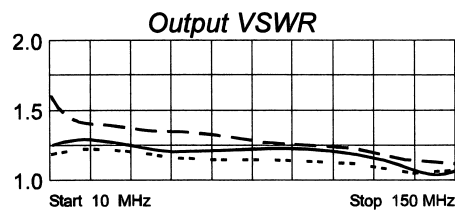
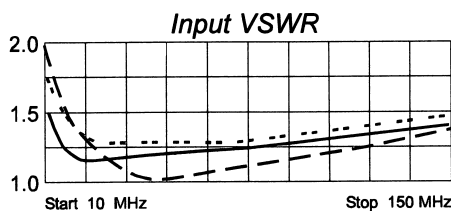
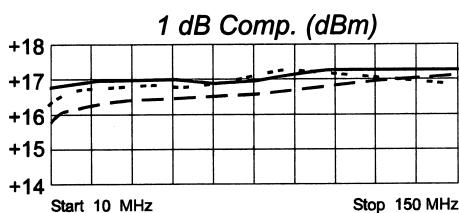
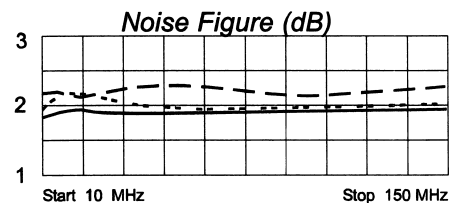
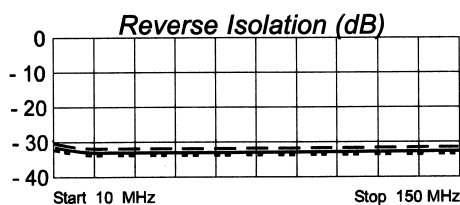
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.23	- 99	.2464	-165	.02	- 4	.11	-161
25	.09	-145	.2510	175	.02	- 1	.13	171
50	.07	151	.2487	168	.02	- 1	.12	153
75	.09	109	.2467	144	.02	- 1	.11	133
100	.12	81	.2439	130	.02	- 2	.08	124
125	.14	64	.2414	117	.02	-10	.05	105
150	.16	53	.2380	105	.03	-10	.02	87
200	.20	26	.2332	79	.03	-15	.04	-132
300	.24	- 32	.2314	27	.02	-47	.13	-169

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RF AMPLIFIER

MODEL *TM7102*

Available as: TM7102, 4 Pin TO-8 (T4)
 TN7102-3, 4 Pin Surface Mount (SM3)
 FP7102-4, 4 Pin Flatpack (FP4)
 BX7102, Connectorized Housing (H1)

Features

- Low Noise Figure: 2 dB Typical
- Medium Output Power: +17 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 150 MHz	20 - 150 MHz
Gain (dB)	24.5	22.5 Min.
Power @ 1 dB Comp. (dBm)	+17	+16.0 Min.
Reverse Isolation (dB)	-28	-27 Max.
VSWR In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc mA	+15 31	+15 35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

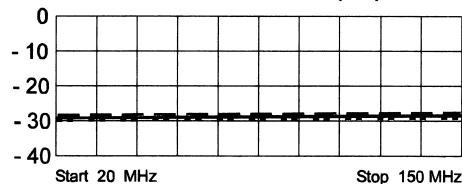
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

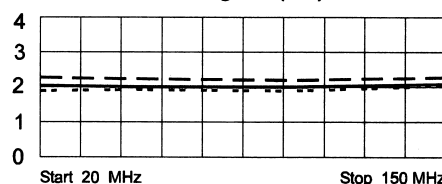
Gain (dB)



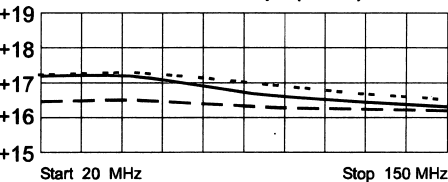
Reverse Isolation (dB)



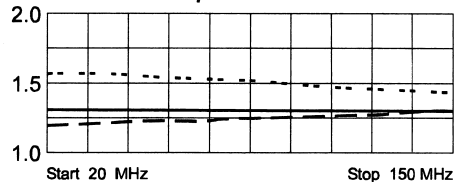
Noise Figure (dB)



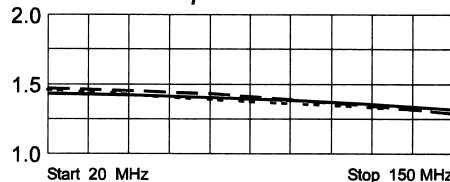
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.13	-148	17.84	-179	.04	6	.20	163
20	.13	-162	17.93	173	.03	2	.18	169
50	.13	-169	17.64	157	.04	4	.17	174
100	.12	-171	16.64	133	.03	-5	.16	178
150	.12	-166	15.32	111	.04	-7	.13	-180
200	.12	-158	13.90	90	.04	-13	.10	-165

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RF AMPLIFIER

MODEL *TM7103*

Available as: TM7103, 4 Pin TO-8 (T4)
 TN7103-3, 4 Pin Surface Mount (SM3)
 FP7103, 4 Pin Flatpack (FP4)
 BX7103, Connectorized Housing (H1)

Features

- 5 Volt Oper.; High Gain: 26 dB Typical
- Low Noise Figure: 2.3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 150 MHz	10 - 150 MHz
Gain (dB)	26.5	25.0 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+8.0 Min.
Reverse Isolation (dB)	- 31	- 30 Max.
VSWR In	1.40:1	2.0:1 Max.
Out	1.40:1	2.0:1 Max.
Noise figure (dB)	2.3	2.75 Max.
Power Vdc	+5	+5
mA	15.5	18 Max.

Note: Care should always be taken to effectively ground the case of each unit.

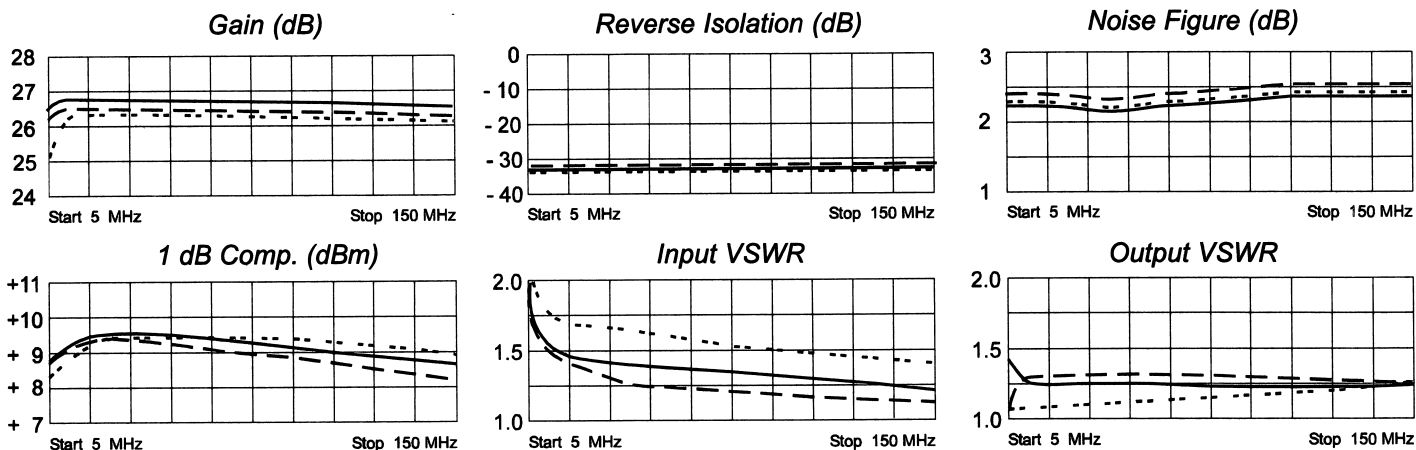
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +34 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.36	- 97	22.85	-152	.02	5	.06	91
25	.21	-169	25.53	171	.02	1	.07	23
50	.19	162	25.21	153	.03	2	.07	16
100	.16	124	24.55	123	.03	- 5	.07	15
150	.13	83	23.90	94	.03	-13	.08	20

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RF AMPLIFIER

MODEL *TM7104*

Available as: TM7104, 4 Pin TO-8 (T4)
 TN7104, 4 Pin Surface Mount (SM3)
 FP7104, 4 Pin Flatpack (FP4)
 BX7104, Connectorized Housing (H1)

Features

- High Gain: 24 dB Typical
- Low Noise Figure: 1.9 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 150 MHz	5 - 150 MHz
Gain (dB)	24	22.5 Min.
Power @ 1 dB Comp. (dBm)	+12	+10.5 Min.
Reverse Isolation (dB)	- 27	- 26 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	1.9	2.5 Max.
Power Vdc	+5	+5
mA	20	23 Max.

Note: Care should always be taken to effectively ground the case of each unit.

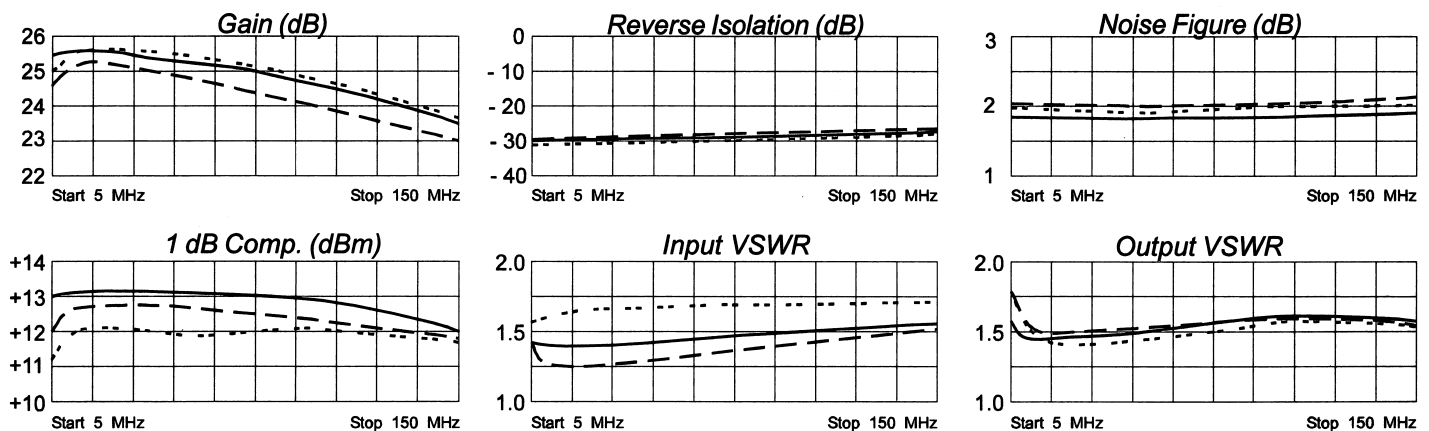
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +31 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.20	-146	18.83	-173	.03	9	.24	169
10	.19	-162	19.10	179	.03	5	.21	171
20	.20	-170	19.08	170	.03	1	.20	174
50	.21	-174	18.44	149	.03	- 2	.20	173
100	.24	-180	16.68	118	.04	- 6	.22	161
150	.27	-172	14.75	91	.04	-12	.21	137
200	.30	-160	12.98	65	.04	-23	.19	101

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RF AMPLIFIER

MODEL *TM7111*

Available as: TM7111, 4 Pin TO-8 (T4)
 TN7111, 4 Pin Surface Mount (SM3)
 FP7111, 4 Pin Flatpack (FP4)
 BX7111, Connectorized Housing (H1)

Features

- Low Noise Figure: 1.4 dB Typical
- Medium Output Power: +17 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 100 MHz	10 - 100 MHz
Gain (dB)	12.5	11.0 Min.
Power @ 1 dB Comp. (dBm)	+17	+15.5 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	1.4	2.0 Max.
Power Vdc	+15	+15
mA	14	15 Max.

Note: Care should always be taken to effectively ground the case of each unit.

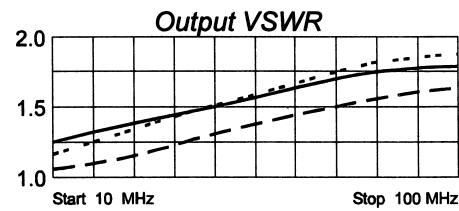
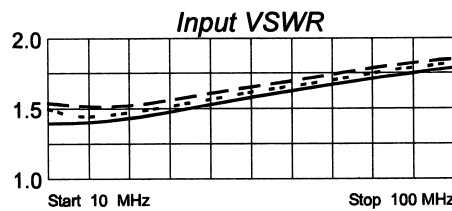
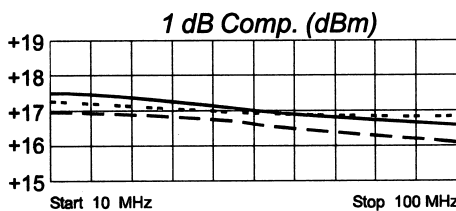
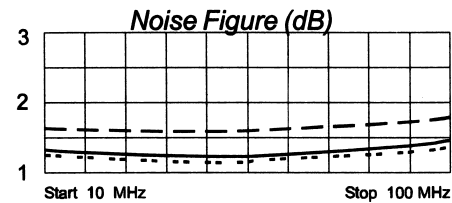
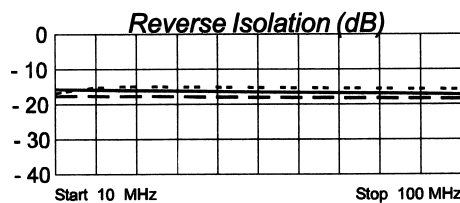
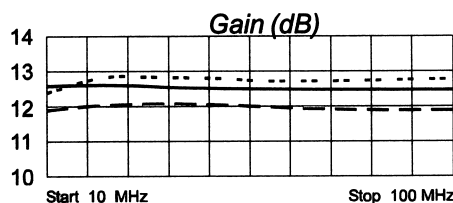
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +47 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C ····· -55 °C

Linear S-Parameters

FREQ. MHz	---S11---	---S21---	---S12---	---S22---
	Mag Deg	Mag Deg	Mag Deg	Mag Deg
5	.16 177	4.24 5	.17 5	.10 23
10	.15 178	4.32 - 3	.17 - 3	.11 - 6
25	.16 -178	4.32 - 18	.17 - 17	.15 - 46
50	.21 175	4.26 - 38	.16 - 36	.21 - 80
75	.25 160	4.21 - 58	.16 - 56	.27 -102
100	.28 141	4.17 - 77	.15 - 74	.29 -119
150	.19 109	4.25 -123	.14 -119	.17 -128

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RF AMPLIFIER

MODEL *TM7147*

Available as: TM7147, 4 Pin TO-8 (T4)
 TN7147, 4 Pin Surface Mount (SM3)
 FP7147, 4 Pin Flatpack (FP4)
 BX7147, Connectorized Housing (H1)
 PN7147, Reduced Size Surface Mount (SM11)

Features

- Low Noise figure: 2.1 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 300 MHz.	10 - 250 MHz.
Gain (dB)		12.5 dB	11 dB Min.
Noise Figure (dB)		2.1 dB	3.0 dB Max.
Power @ 1 dB Comp. (dBm)		+15.5 dBm	+14.0 dBm Min.
VSWR	In	<1.2:1	1.5:1
	Out	<1.2:1	1.5:1 Max.
Power	Vdc	+5	+5
	mA	36 mA	40 mA Max.

Typical Intermodulation Performance at 25 °C

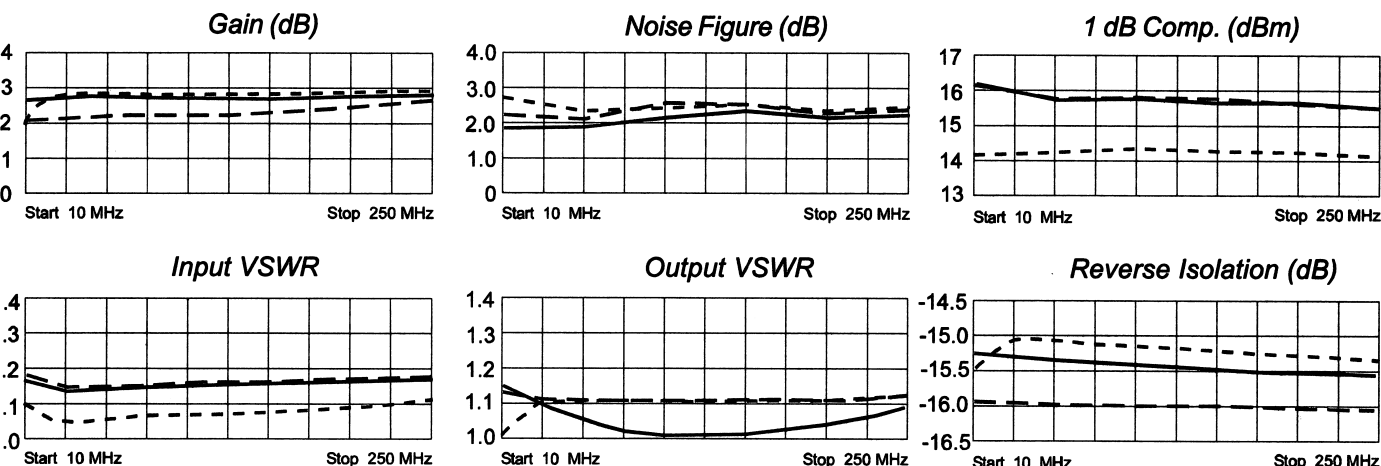
Second Order Harmonic Intercept Point.....+ 52 dBm (Typ.)
 Second Order Two Tone Intercept Point.....+ 46 dBm (Typ.)
 Third Order Two Tone Intercept Point.....+ 31 dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

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RF AMPLIFIER

MODEL *TM7170*

Available as: TM7170, 4 Pin TO-8 (T4)
 TN7170, 4 Pin Surface Mount (SM3)
 FP7170, 4 Pin Flatpack (FP4)
 BX7170, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.5 dB Typical
- High Efficiency: +10 dBm @ 11.5 mA Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 250 MHz	10 - 250 MHz
Gain (dB)	8.5	7.5 Min.
Power @ 1 dB Comp. (dBm)	+10	+ 9.0 Min.
Reverse Isolation (dB)	- 9.5	- 9.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<1.5	2.5 Max.
Power Vdc	+15	+15
mA	11.5	12.5 Max.

Note: Care should always be taken to effectively ground the case of each unit.

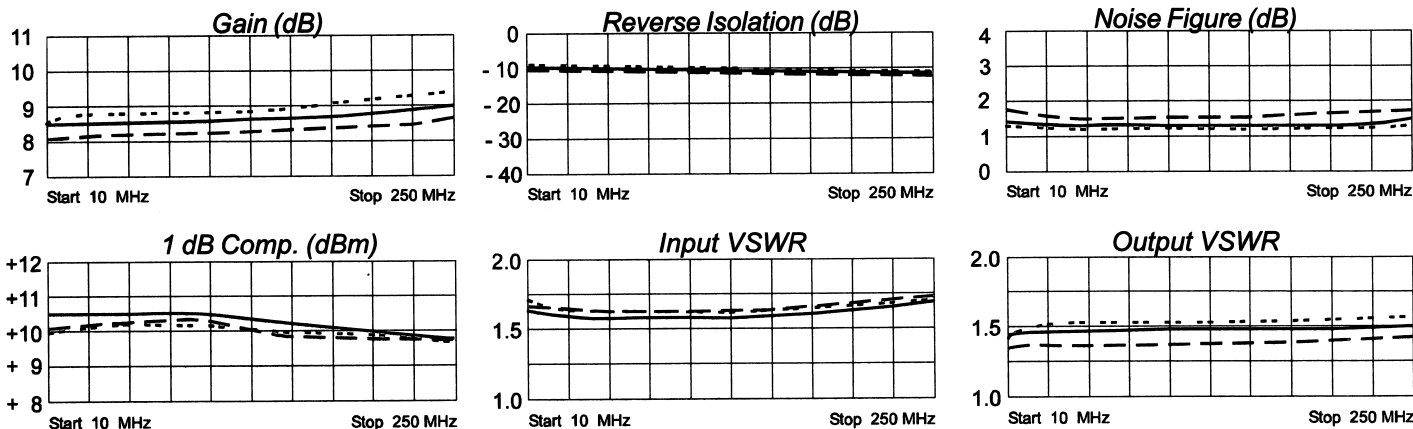
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.23	179	2.64	3	.27	3	.18	10
20	.22	177	2.67	-1	.27	-1	.19	2
50	.22	173	2.67	-8	.27	-7	.19	-8
100	.23	168	2.68	-18	.26	-16	.19	-22
150	.23	164	2.71	-27	.26	-25	.19	-35
200	.24	161	2.76	-37	.25	-33	.20	-51
250	.26	158	2.82	-47	.24	-43	.20	-69
300	.29	156	2.92	-57	.22	-52	.22	-90

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RF AMPLIFIER

MODEL *TM7201*

Available as: TM7201, 4 Pin TO-8 (T4)
 TN7201, 4 Pin Surface Mount (SM3)
 FP7201, 4 Pin Flatpack (FP4)
 BX7201, Connectorized Housing (H1)

Features

- High Gain: 29 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	29	27.5 Min.
Power @ 1 dB Comp. (dBm)	+ 7	+ 5.5 Min.
Reverse Isolation (dB)	- 40	- 38 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.4:1	2.0:1 Max.
Noise figure (dB)	< 5.0	6.5 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

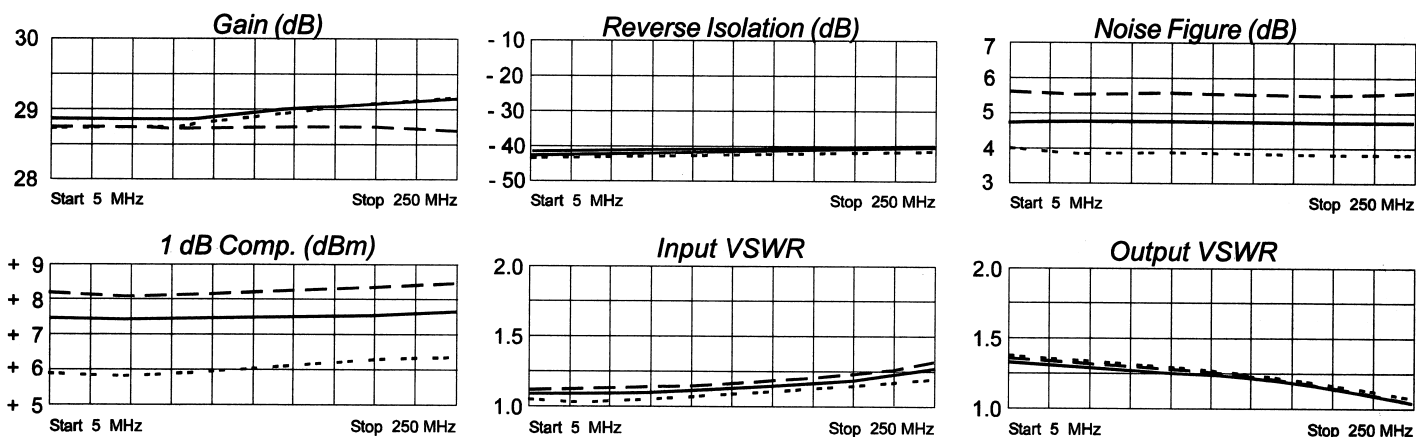
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.05	-27	27.77	2	.01	8	.14	-10
25	.04	-16	27.75	-10	.01	10	.13	-7
50	.04	-23	27.80	-21	.01	21	.13	-9
100	.05	-43	27.97	-43	.01	11	.12	-19
150	.07	-49	28.22	-64	.01	29	.09	-28
200	.08	-54	28.43	-87	.01	25	.06	-37
250	.11	-59	28.69	-110	.01	32	.02	-61

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RF AMPLIFIER

MODEL *TM7202*

Available as: TM7202, 4 Pin TO-8 (T4)
 TN7202, 4 Pin Surface Mount (SM3)
 FP7202, 4 Pin Flatpack (FP4)
 BX7202, Connectorized Housing (H1)

Features

- High Gain: 27 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	27	26.0 Min.
Power @ 1 dB Comp. (dBm)	+16.5	+15.0 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.0	6.5 Max.
Power Vdc	+15	+15
mA	88	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

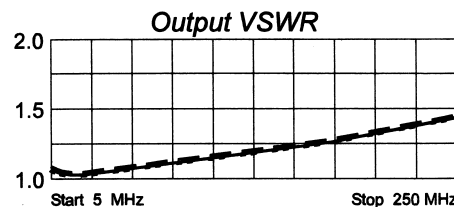
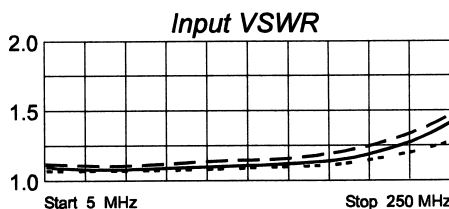
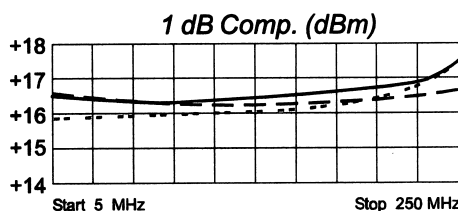
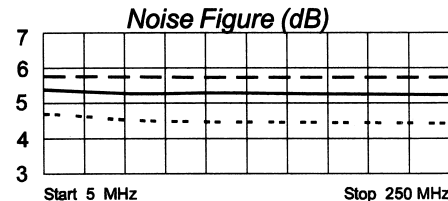
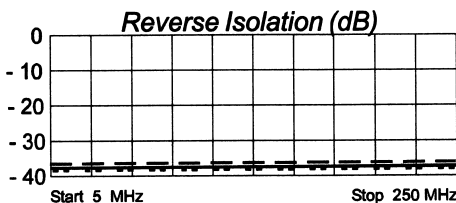
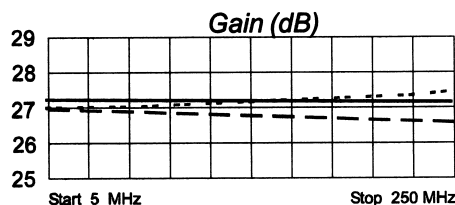
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	-76	22.89	2	.01	5	.03	-104
25	.01	-72	22.87	- 11	.01	16	.02	-116
50	.02	-67	22.80	- 24	.01	7	.04	-118
100	.03	-67	22.80	- 49	.01	39	.07	-139
150	.05	-52	22.82	- 74	.01	38	.10	-155
200	.08	-43	22.76	- 99	.01	41	.14	-171
250	.15	-44	22.71	-125	.01	35	.19	176

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RF AMPLIFIER

MODEL *TM7203*

Available as: TM7203, 4 Pin TO-8 (T4)
 TN7203, 4 Pin Surface Mount (SM3)
 FP7203, 4 Pin Flatpack (FP4)
 BX7203, Connectorized Housing (H1)

Features

- Low Noise Figure: 3.5 dB Typical
- High Gain: +32 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta= -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	32	30.0 Min.
Power @ 1 dB Comp. (dBm)	+ 8	+ 6.5 Min.
Reverse Isolation (dB)	- 40	- 37 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	3	4.0 Max.
Power Vdc	+15	+15
mA	35	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

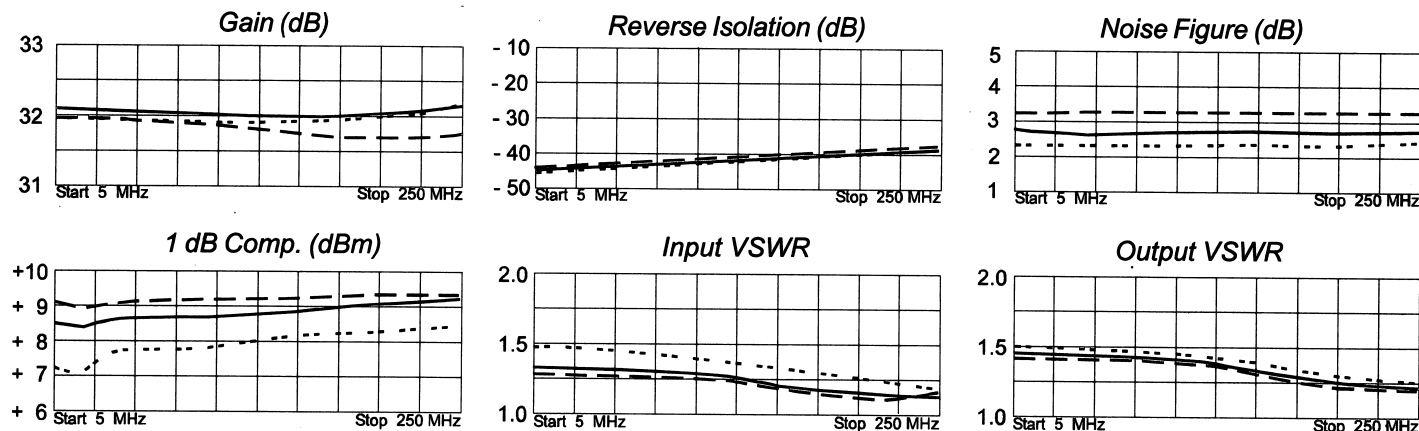
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +18 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	-169	40.30	2	.01	-0	.19	-7
10	.14	-175	40.29	-2	.01	3	.19	-5
20	.13	-178	40.24	-8	.01	1	.19	-7
50	.13	-179	40.09	-24	.01	10	.18	-14
100	.12	177	39.69	-47	.01	17	.16	-27
150	.10	177	39.77	-70	.01	23	.14	-44
200	.07	-176	39.96	-94	.01	23	.11	-69
250	.04	-113	40.67	-118	.01	27	.09	-119
300	.14	-75	41.64	-145	.01	20	.16	-169

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RF AMPLIFIER

MODEL *TM7205*

Available as: TM7205, 4 Pin TO-8 (T4)
 TN7205, 4 Pin Surface Mount (SM3)
 FP7205, 4 Pin Flatpack (FP4)
 BX7205, Connectorized Housing (H1)

Features

- 5 Volt Oper.; Low Noise: 1.6 dB Typical
- High Gain: 20 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 200 MHz	10 - 200 MHz
Gain (dB)	20	19 Min.
Power @ 1 dB Comp. (dBm)	+14	+12.0 Min.
Reverse Isolation (dB)	- 24	- 23 Max.
VSWR In	<1.8:1	2.0:1 Max.
Out	<1.6:1	2.0:1 Max.
Noise figure (dB)	1.6	2.2 Max.
Power Vdc	+5	+5
mA	18	21 Max.

Note: Care should always be taken to effectively ground the case of each unit.

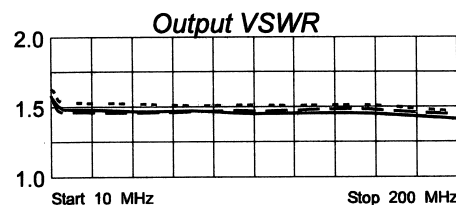
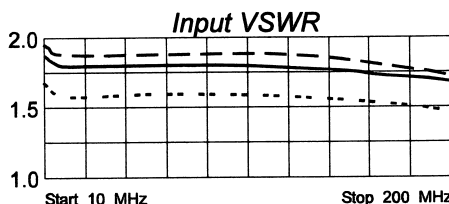
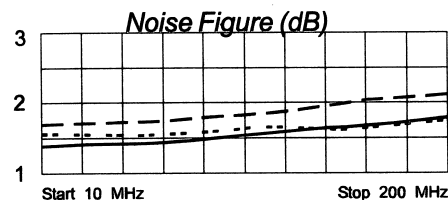
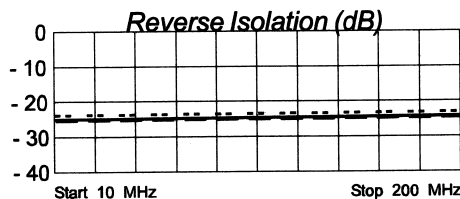
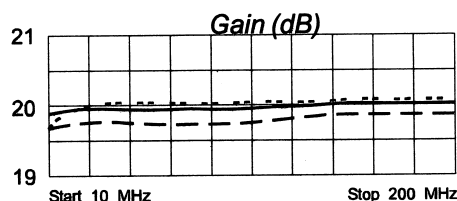
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +32 (Typ.)
 Second Order Two Tone Intercept Point +26 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.31	- 20	9.69	-176	.05	-177	.23	- 22
50	.30	- 33	9.78	159	.05	153	.21	- 12
100	.29	- 61	9.72	136	.05	128	.20	- 16
150	.28	- 92	9.70	113	.06	100	.20	- 28
200	.24	-130	9.62	88	.06	75	.19	- 45
250	.20	167	9.43	60	.06	47	.15	- 77
300	.26	80	8.52	29	.06	20	.10	-144

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RF AMPLIFIER

MODEL *TM7207*

Available as: TM7207, 4 Pin TO-8 (T4)
 TN7207-3, 4 Pin Surface Mount (SM3)
 FP7207-4, 4 Pin Flatpack (FP4)
 BX7207, Connectorized Housing (H1)

Features

- Medium Output Power: +16 dBm Typ.
- Low Noise Figure: 2 dB Typ.
- Operating Temp. -55 °C to +85 °C

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 200 MHz
Gain (dB)	18	17 Min.
Power @ 1 dB Comp. (dBm)	+16	+15 Min.
Reverse Isolation (dB)	-21	-21 Max.
VSWR In Out	<1.7:1 <1.7:1	2:01 Max. 2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc mA	+15 33	+15 40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

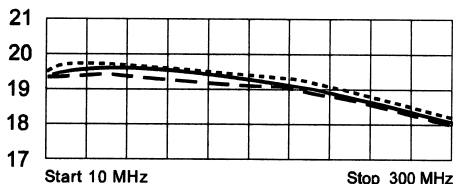
Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

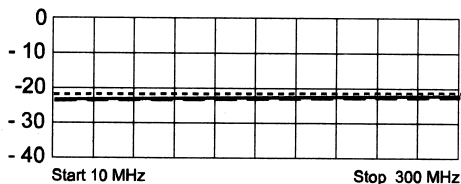
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

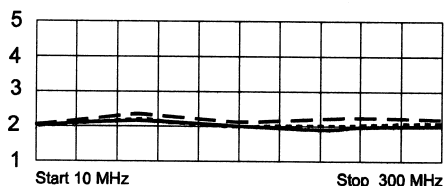
Gain (dB)



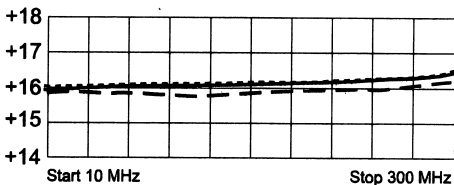
Reverse Isolation (dB)



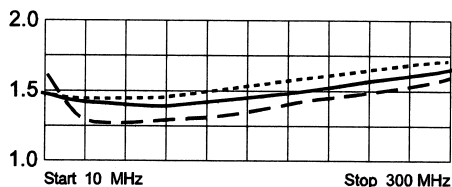
Noise Figure (dB)



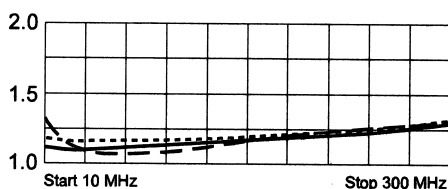
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

Freq MHz	---S11---		---S21---		---S12---		---S22---	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.21	-39	9.42	-172	.069	-171	.15	-56
50	.15	-29	9.53	167	.069	165	.05	-8
100	.16	-41	9.35	150	.073	148	.06	23
150	.17	-59	9.16	134	.077	132	.08	37
200	.19	-77	8.88	118	.081	119	.10	41
250	.21	-98	8.51	102	.085	104	.12	43
300	.22	-120	8.01	87	.090	92	.14	40

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RF AMPLIFIER

MODEL *TM7208*

Available as: TM7208, 4 Pin TO-8 (T4)
 TN7208, 4 Pin Surface Mount (SM3)
 FP7208, 4 Pin Flatpack (FP4)
 BX7208, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.4 dB Typical
- High Gain: 22.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	22.5	21.0 Min.
Power @ 1 dB Comp. (dBm)	+ 3	+ 0.0 Min.
Reverse Isolation (dB)	- 25	- 24 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	<1.4	2.0 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

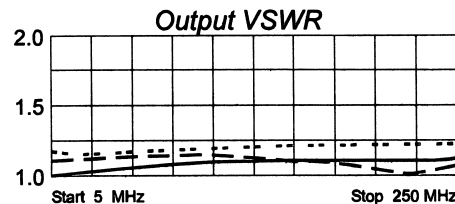
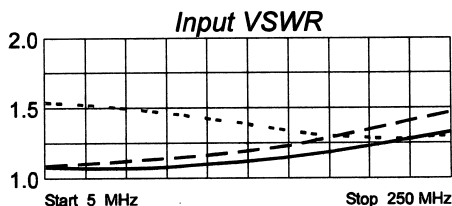
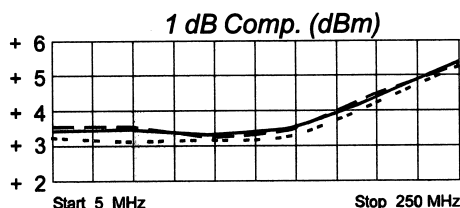
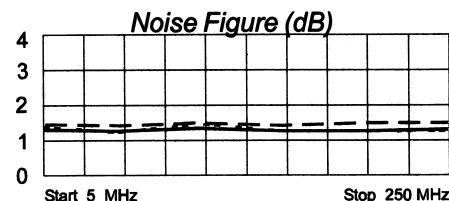
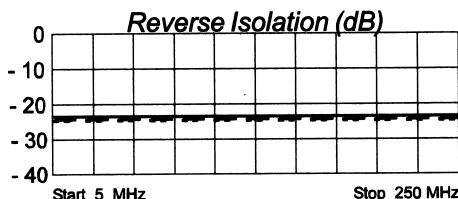
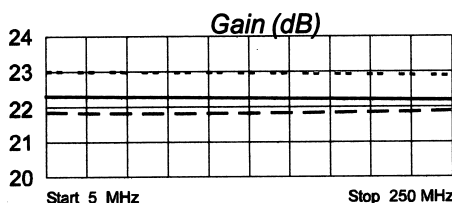
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +20 (Typ.)
 Second Order Two Tone Intercept Point +13 (Typ.)
 Third Order Two Tone Intercept Point +16 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	-165	13.11	-178	.05	5	.01	-140
50	.02	-159	12.99	164	.05	-1	.03	79
100	.04	-128	13.00	147	.05	1	.04	64
150	.07	-115	13.02	130	.05	1	.04	65
200	.11	-117	13.04	112	.06	-1	.04	76
250	.16	-126	12.97	93	.06	-1	.07	110

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RF AMPLIFIER

MODEL *TM7210*

Available as: TM7210, 4 Pin TO-8 (T4)
 TN7210, 4 Pin Surface Mount (SM3)
 FP7210, 4 Pin Flatpack (FP4)
 BX7210, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.5dB Typical
- High Power: +13 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10-300 MHz	10-200 MHz
Gain (dB)	9±0.5	8.0 Min.
Power @ 1 dB Comp. (dBm)	+14	+12.5 Min.
Reverse Isolation (dB)	- 11.5	- 11 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.35:1	2.0:1 Max.
Noise figure (dB)	1.3	2.0 Max.
Power Vdc	+15	+15
mA	15	17 Max.

Note: Care should always be taken to effectively ground the case of each unit.

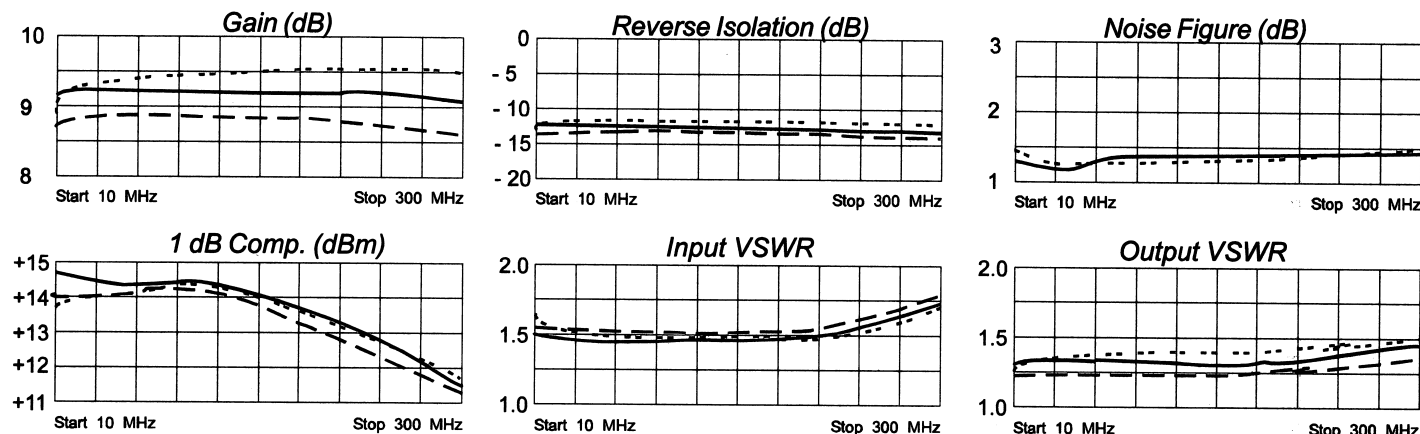
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.21	180	2.85	2	.26	8	.13	8
50	.19	173	2.89	-11	.26	-14	.15	-14
100	.19	170	2.89	-24	.26	-38	.14	-38
150	.18	169	2.89	-36	.26	-62	.14	-62
200	.20	170	2.88	-49	.25	-91	.13	-91

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 3/18/03

RF AMPLIFIER

MODEL TM7211

Available as: TM7211, 4 Pin TO-8 (T4)
 TN7211, 4 Pin Surface Mount (SM3)
 FP7211, 4 Pin Flatpack (FP4)
 BX7211, Connectorized Housing (H1)

Features

- Low Noise Figure: <2.0 dB Typical
- High Power: +20 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10-200 MHz	30 -200 MHz
Gain (dB)	8.5	7.5 Min.
Power @ 1 dB Comp. (dBm)	+20	+19.0 Min.
Reverse Isolation (dB)	- 12	- 11 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.35:1	2.0:1 Max.
Noise figure (dB)	1.8	3.0 Max.
Power Vdc	+15	+15
mA	30	33 Max.

Note: Care should always be taken to effectively ground the case of each unit.

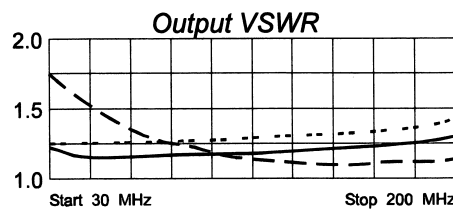
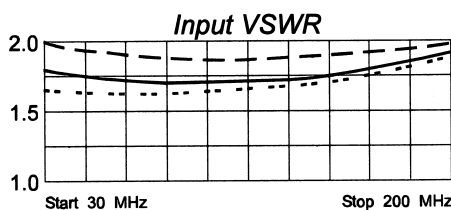
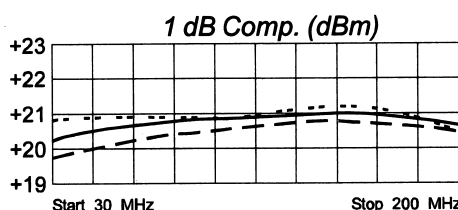
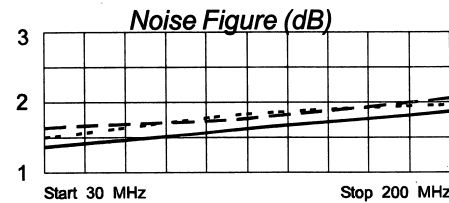
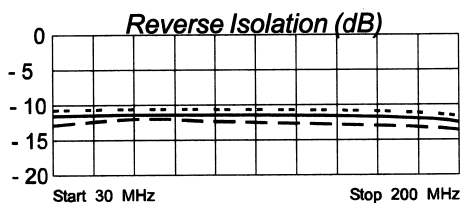
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +61 (Typ.)
 Second Order Two Tone Intercept Point +55 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 15 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C ······ -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.33	155	2.61	11	.24	12	.21	95
50	.28	165	2.71	- 1	.25	- 2	.08	60
100	.27	169	2.73	-14	.25	-14	.05	-25
150	.28	172	2.76	-24	.24	-23	.08	-74
200	.31	171	2.78	-34	.23	-33	.13	-96

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RF AMPLIFIER

MODEL TR7215

Available as: RN7215, 4 Pin Surface Mount (SM19)
BR7215, Connectorized Housing (H2)

Features

- High Gain: 31.5 dB Typical
- Medium Output Power: +13.5 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 200 MHz	5 - 200 MHz
Gain (dB)	31.5	30.0 Min.
Power @ 1 dB Comp. (dBm)	+13	+10.0 Min.
Reverse Isolation (dB)	- 40	- 35 Max.
VSWR In	<1.10:1	1.5:1 Max.
Out	<1.25:1	1.5:1 Max.
Noise figure (dB)	2.5	4.0 Max.
Power Vdc	+15	+15
mA	58	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

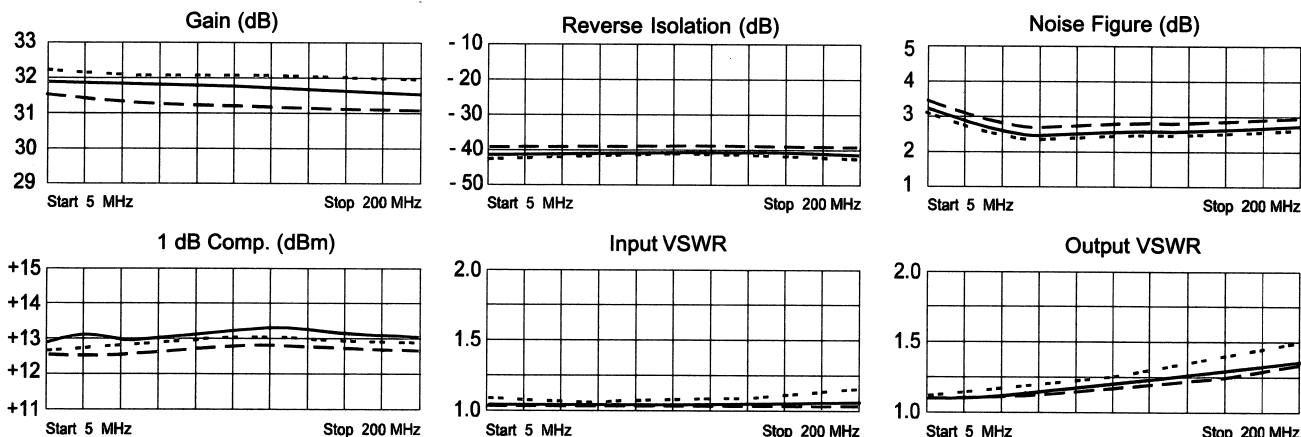
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +45 (Typ.)
Second Order Two Tone Intercept Point +39 (Typ.)
Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	- 54	39.35	2	.01	4	.07	-175
25	.01	- 86	38.74	- 9	.01	- 2	.08	-176
50	.02	-160	38.53	- 19	.01	10	.09	-168
75	.04	-160	38.23	-28	.01	21	.10	-168
100	.05	-150	38.26	-37	.01	7	.12	-175
125	.05	-148	38.18	-46	.01	29	.13	178
150	.04	-162	38.18	-56	.01	15	.12	173
175	.03	161	37.93	-66	.01	31	.14	174
200	.05	147	38.06	-75	.01	27	.16	172

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2707 Black Lake Place, Philadelphia, PA 19154

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RF AMPLIFIER

MODEL TR7216

Available as: RN7216, 4 Pin Surface Mount (SM19)
BR7216, Connectorized Housing (H2)

Features

- Low Noise Figure: < 2.5 dB Typical
- High 3rd Order Intercept: > +33 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 500 MHz	10 - 500 MHz
Gain (dB)	25.5	24.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+18.0 Min.
Reverse Isolation (dB)	- 32	- 30 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+12	+12
mA	65	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

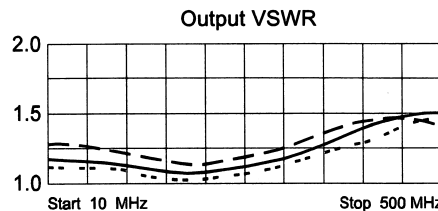
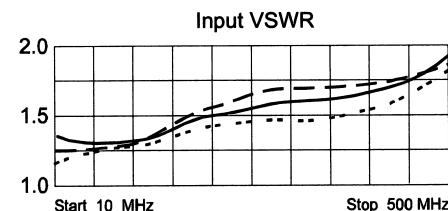
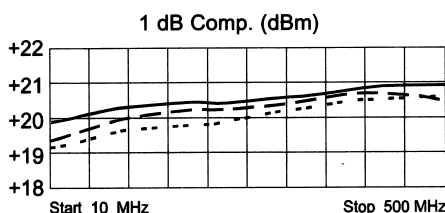
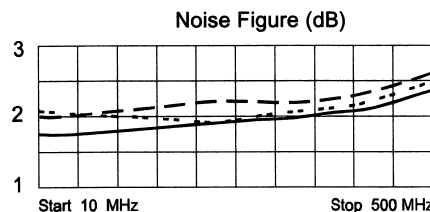
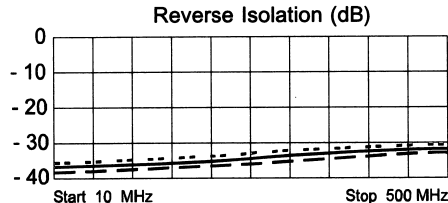
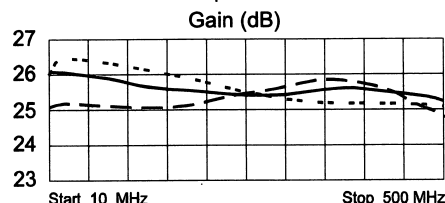
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point+49 (Typ.)
Second Order Two Tone Intercept Point+44 (Typ.)
Third Order Two Tone Intercept Point+33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.16	- 29	20.16	9	.01	1	.09	-137
20	.14	- 29	20.14	- 4	.01	- 4	.08	-162
50	.14	- 43	19.77	- 26	.01	- 30	.08	171
100	.15	- 69	19.35	- 55	.01	- 69	.06	145
200	.19	-115	18.91	-110	.01	-123	.05	149
300	.21	-154	18.60	-166	.02	173	.10	127
400	.24	173	18.70	135	.03	135	.17	77
500	.31	135	18.02	72	.03	88	.20	23

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RF AMPLIFIER

MODEL TR7217

Available as: TR7217, 4 Pin TO-8B (T8)
 TN7217-8, 10 Pin Gull-Wing Flatpack (SG4)
 BR7217, Connectrized Housing (H2)

Features

- Low Noise Figure: < 2.5 dB Typical
- High 3rd Order Intercept: > +33 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	25.5	24.0 Min.
Power @ 1 dB Comp. (dBm)	+20	+18 Min.
Reverse Isolation (dB)	- 32	- 30 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.0 Max.
Power Vdc	+15	+15
mA	65	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

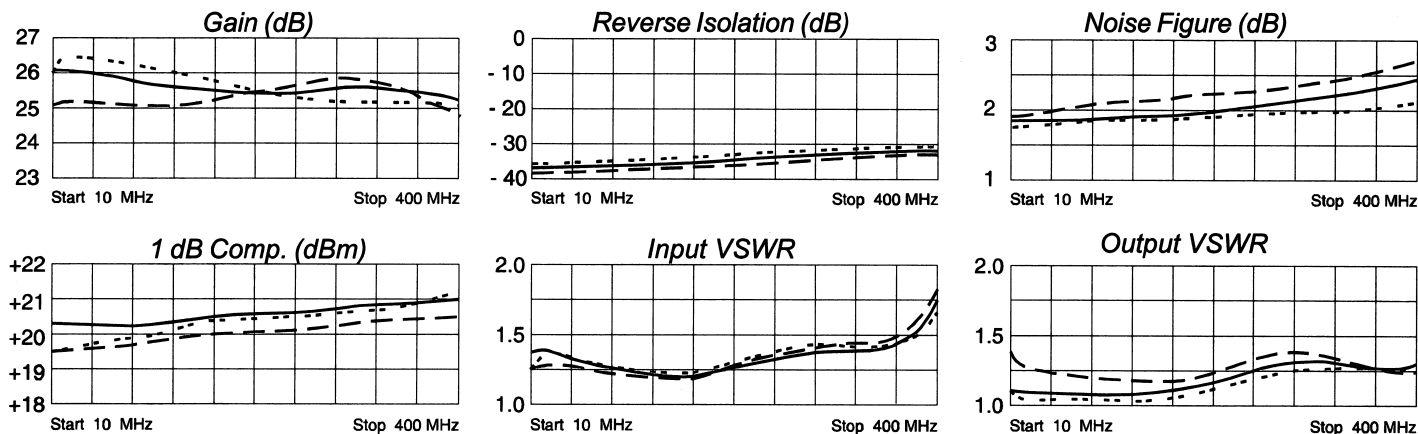
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power.....0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.17	- 21	19.49	26	.01	22	.08	-89
10	.16	- 14	20.21	9	.01	4	.04	-131
50	.14	- 33	19.79	- 24	.01	- 27	.03	155
100	.12	- 62	19.38	- 49	.01	- 52	.03	113
200	.10	-148	19.25	- 99	.01	-110	.03	134
300	.15	139	19.45	-150	.02	-163	.10	130
400	.26	129	18.48	94	.02	118	.11	105

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RF AMPLIFIER

MODEL *TM7221*

Available as: TM7221, 4 Pin TO-8 (T4)
 TN7221, 4 Pin Surface Mount (SM3)
 FP7221, 4 Pin Flatpack (FP4)
 BX7221, Connectorized Housing (H1)

Features

- Low Noise Figure: 2 dB Typical
- High Gain: 28.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 200 MHz	20 - 200 MHz
Gain (dB)	28.5	27.0 Min.
Power @ 1 dB Comp. (dBm)	+18.5	+15 Min.
Reverse Isolation (dB)	- 31.5	- 30 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.4:1	2.0:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	29	32 Max.

Note: Care should always be taken to effectively ground the case of each unit.

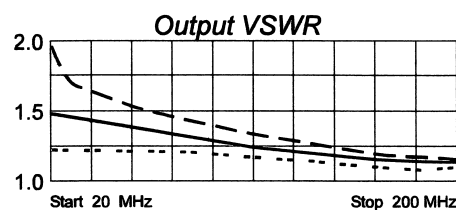
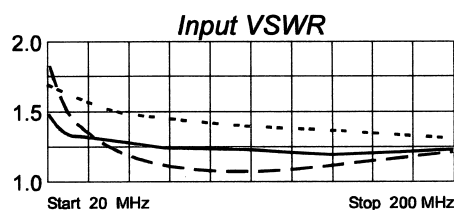
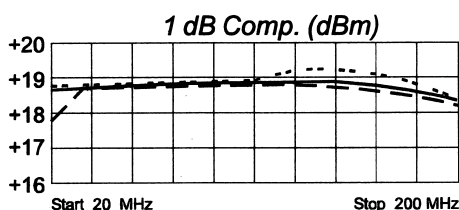
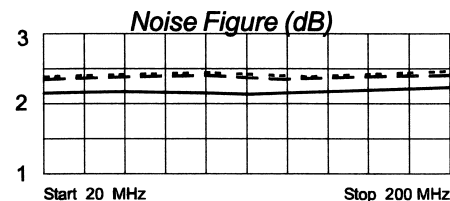
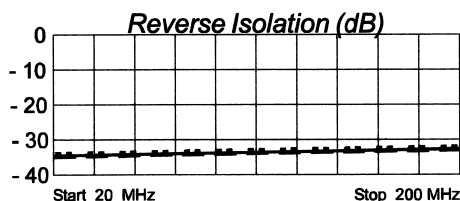
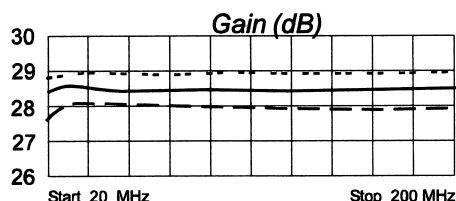
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.39	- 92	25.50	-151	.02	14	.24	140
25	.18	-130	26.62	-178	.02	2	.18	153
50	.12	-169	26.61	163	.02	2	.17	148
100	.09	139	26.43	135	.02	6	.14	135
150	.08	76	26.38	110	.03	- 5	.10	127
200	.10	20	26.34	85	.02	-11	.06	132
300	.26	- 69	27.30	33	.02	-27	.05	-161

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RF AMPLIFIER

MODEL TM7222

Available as: TM7222, 4 Pin TO-8 (T4)
 TN7222, 4 Pin Surface Mount (SM3)
 FP7222, 4 Pin Flatpack (FP4)
 BX7222, Connectrized Housing (H1)

Features

- High Gain: 29 dB Typical
- Low Noise Figure: <2.9 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20-250 MHz	20-250 MHz
Gain (dB)	29	27.5 Min.
Power @ 1 dB Comp. (dBm)	+20.5	+18.0 Min.
Reverse Isolation (dB)	+18.0	- 34 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<2.9	4.0 Max.
Power Vdc	+15	+15
mA	47	52 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

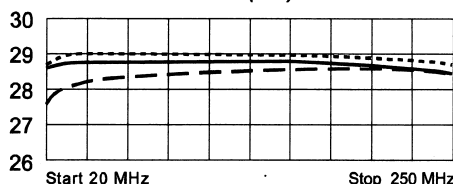
Second Order Harmonic Intercept Point +44 (Typ)
 Second Order Two Tone Intercept Point +38 (Typ)
 Third Order Two Tone Intercept Point +32 (Typ)

Maximum Ratings

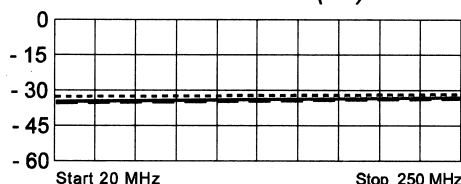
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power.....50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power..... 0.5 Watt
 (3 ,usec Max.)

Typical Performance Data

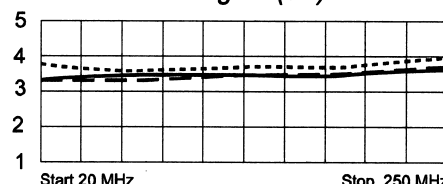
Gain (dB)



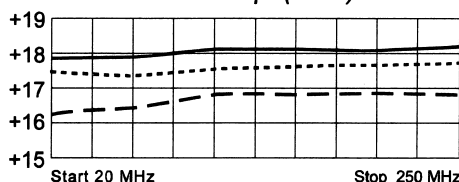
Reverse Isolation (dB)



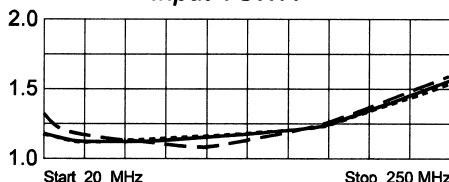
Noise Figure (dB)



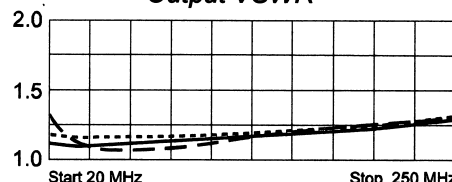
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.42	- 86	26.71	-141	.02	16	.33	105
20	.21	-118	28.88	-170	.02	7	.18	95
50	.11	165	29.24	158	.02	- 1	.14	61
100	.17	95	28.73	124	.02	-13	.14	- 0
150	.23	59	28.29	92	.02	-18	.18	- 63
200	.28	29	27.96	60	.02	-46	.26	-127
250	.29	- 4	28.50	27	.01	-56	.38	-172
300	.26	- 53	31.16	- 12	.01	-59	.46	156

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RF AMPLIFIER

MODEL *TM7270*

Available as: TM7270, 4 Pin TO-8 (T4)
 TN7270, 4 Pin Surface Mount (SM3)
 FP7270, 4 Pin Flatpack (FP4)
 BX7270, Connectorized Housing (H1)

Features

- Low Noise Figure: <1.6 dB Typical
- High Efficiency: +15 dBm @ 15 mA Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 250 MHz	10 - 250 MHz
Gain (dB)	8.3	7.0 Min.
Power @ 1 dB Comp. (dBm)	+13 * +15 **	+11.0 * Min. +13.0 ** Min.
Reverse Isolation (dB)	- 10.5	- 10.0 Max.
VSWR In	1.5:1	1.8:1 Max.
Out	1.3:1	1.8:1 Max.
Noise figure (dB)	1.4	2.5 Max.
Power Vdc mA	+15 15	+15 18 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
 Second Order Two Tone Intercept Point +50 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

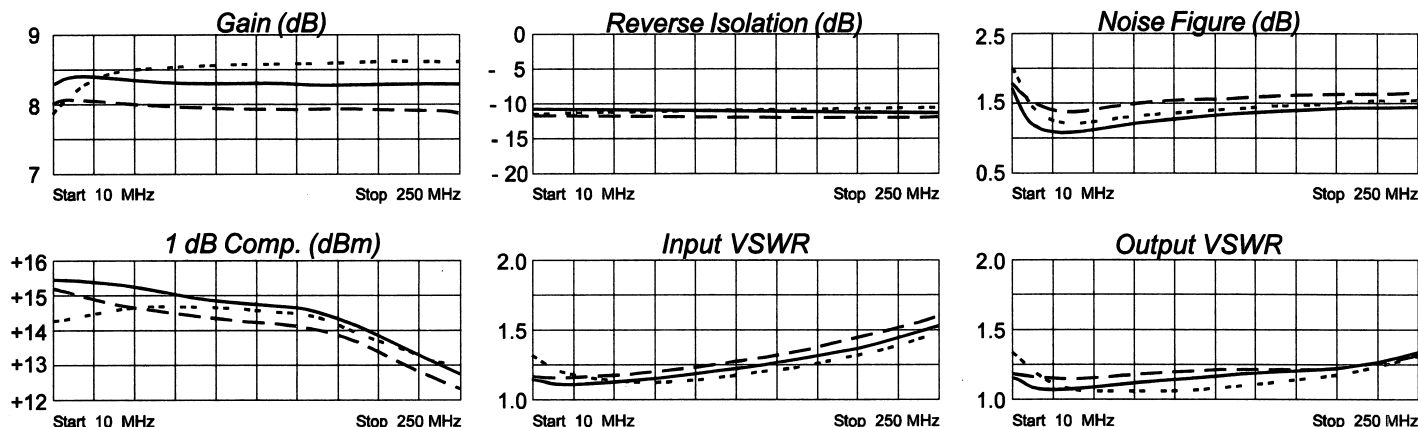
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Frequency = 10 - 250 MHz

** Frequency = 10 - 160 MHz

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.06	135	2.43	10	.27	10	.08	146
10	.04	128	2.48	4	.28	4	.04	148
20	.03	125	2.50	-2	.28	-1	.03	-156
50	.05	170	2.49	-10	.28	-10	.08	-136
100	.12	-171	2.47	-21	.27	-20	.12	-151
150	.20	-160	2.50	-32	.27	-32	.11	-151
200	.25	-157	2.49	-44	.26	-43	.15	-132
250	.26	-166	2.45	-55	.24	-55	.24	-140
300	.31	174	2.41	-67	.22	-66	.32	-154

Amplifonix

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3/18/03

RF AMPLIFIER

MODEL TM7271

Available as: TM7271, 4 Pin TO-8 (T4)
 TN7271, 4 Pin Surface Mount (SM3)
 FP7271, 4 Pin Flatpack (FP4)
 BX7271, Connectorized Housing (H1)

Features

- Low Noise Figure: < 2.0 dB Typical
- High Gain: 18 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	1 - 300 MHz	5 - 250 MHz
Gain (dB)	18	16.0 Min.
Power @ 1 dB Comp. (dBm)	+0.5	-1.0 Min.
Reverse Isolation (dB)	-23	-22 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	1.5	2.8 Max.
Power Vdc	+15	+15
mA	9	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

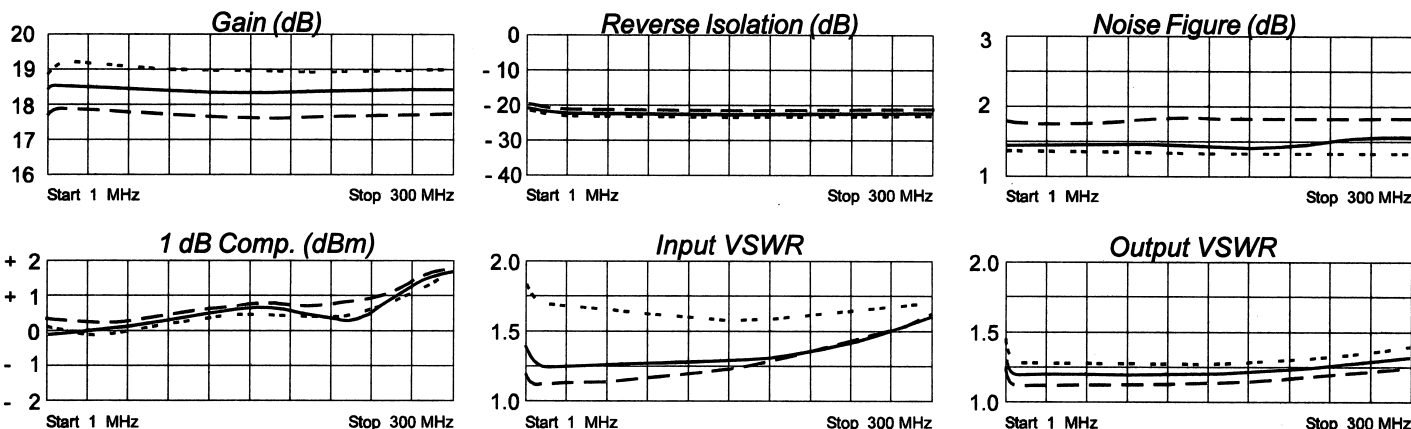
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +18 (Typ.)
 Second Order Two Tone Intercept Point +13 (Typ.)
 Third Order Two Tone Intercept Point +13 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11 Mag	S11 Deg	S21 Mag	S21 Deg	S12 Mag	S12 Deg	S22 Mag	S22 Deg
1	.16	-148	8.36	-163	.05	20	.12	-140
5	.12	-173	8.48	-178	.06	4	.09	-174
50	.11	-178	8.39	167	.06	-1	.08	162
100	.11	-171	8.31	154	.06	-2	.08	150
150	.12	-161	8.23	142	.06	-4	.08	143
200	.14	-155	8.25	129	.06	-6	.09	136
250	.18	-154	8.28	116	.06	-9	.12	130
300	.22	-157	8.33	103	.07	-11	.15	121

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RF AMPLIFIER

MODEL TM7272

Available as: TM7272, 4 Pin TO-8 (T4)
 TN7272, 4 Pin Surface Mount (SM3)
 FP7272, 4 Pin Flatpack (FP4)
 BX7272, Connectorized Housing (H1)

Features

- Gain: 14.7 dB Typical
- Low VSWR: 1.25:1 Maximum
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	10 - 200 MHz
Gain (dB)	14.7	14 Min/ 15.5 Max
Power @ 1 dB Comp. (dBm)	+14	+12.0 Min.
Reverse Isolation (dB)	- 18.5	- 18 Max.
VSWR In	<1.15:1	1.25:1 Max.
VSWR Out	<1.15:1	1.25:1 Max.
Noise figure (dB)	3.0	5.0 Max.
Power Vdc mA	+5 35	+5 38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

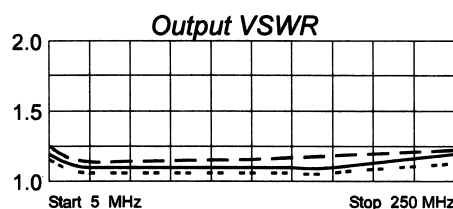
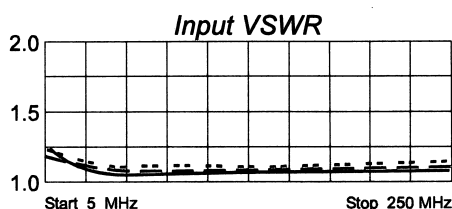
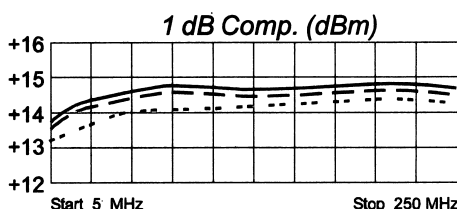
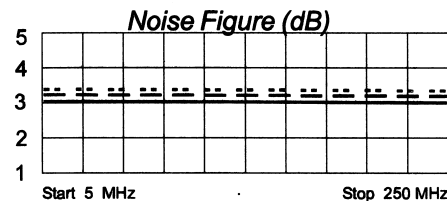
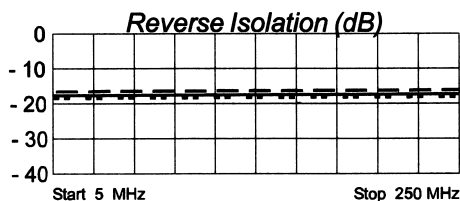
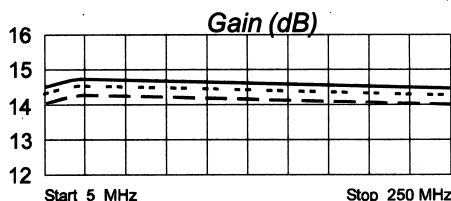
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +41 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.09	- 92	5.34	-172	.11	10	.10	126
50	.02	179	5.49	173	.12	2	.02	-176
100	.02	128	5.44	163	.12	- 0	.03	-140
150	.03	108	5.44	145	.12	- 1	.04	-131
200	.03	96	5.42	147	.11	- 1	.05	-133
250	.04	71	5.42	138	.12	- 1	.07	-137

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RF AMPLIFIER

MODEL TM7274

Available as: TM7274, 4 Pin TO-8 (T4)
 TN7274, 4 Pin Surface Mount (SM3)
 FP7274, 4 Pin Flatpack (FP4)
 BX7274, Connectorized Housing (H1)

Features

- High Gain: 31 db Typical
- Medium Output Power: +9.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	31	29 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+8.0 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3	4.0 Max.
Power Vdc	+15	+15
mA	40	44 Max.

Note: Care should always be taken to effectively ground the case of each unit.

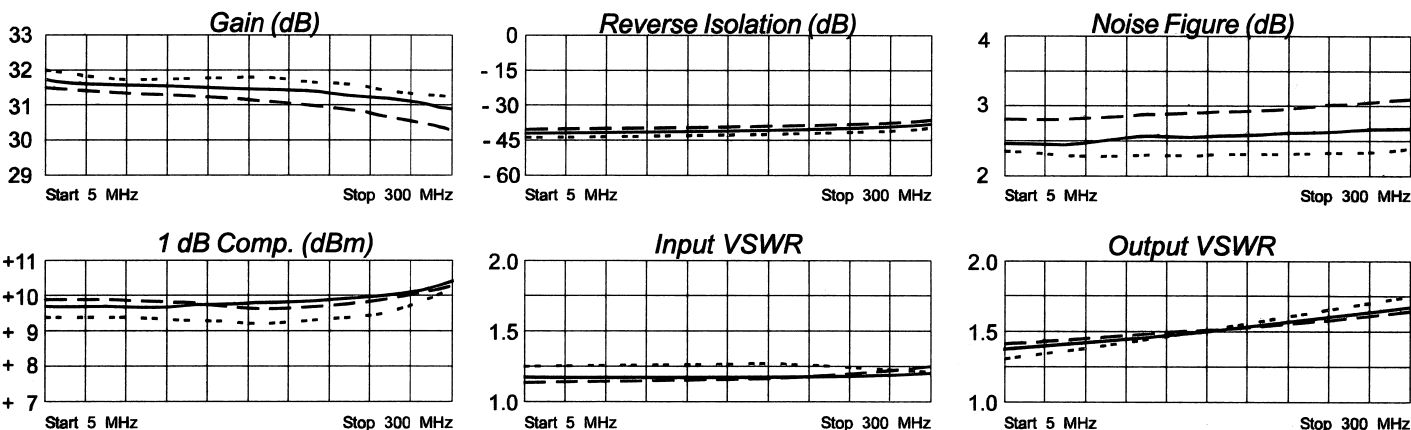
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-163	36.70	3	.01	7	.17	-174
10	.10	-173	36.76	- 3	.01	4	.17	-177
50	.10	162	36.20	- 24	.01	- 2	.17	177
100	.10	139	36.14	- 49	.01	7	.19	173
200	.10	86	35.42	- 98	.01	19	.23	156
300	.10	12	33.84	-148	.01	8	.26	135
400	.17	- 71	31.35	159	.01	- 2	.29	117

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RF AMPLIFIER

MODEL *TM7275*

Available as: TM7275, 4 Pin TO-8 (T4)
 TN7275, 4 Pin Surface Mount (SM3)
 FP7275, 4 Pin Flatpack (FP4)
 BX7275, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- Low Noise Figure: <3.0 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	20.5	19.0 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+8.0 Min.
Reverse Isolation (dB)	-25	-22 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.5	3.5 Max.
Power Vdc	+15	+15
mA	24	27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

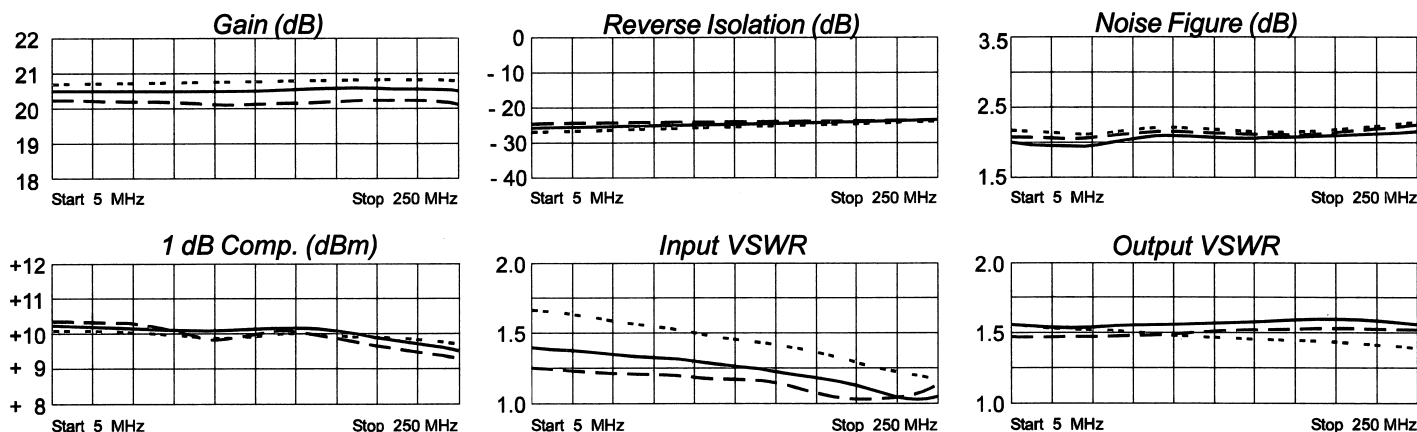
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +27 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C ---- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.17	-176	10.65	-178	.06	5	.21	-173
10	.16	179	10.63	179	.06	3	.21	-177
25	.16	173	10.62	173	.06	1	.21	-179
50	.15	165	10.61	164	.06	3	.21	-180
100	.13	148	10.61	148	.06	1	.21	-178
150	.10	134	10.62	132	.06	-1	.22	180
200	.16	115	10.59	114	.07	-0	.22	176
250	.01	-34	10.58	97	.07	-3	.23	169

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RF AMPLIFIER

MODEL *TM7277*

Available as: TM7277, 4 Pin TO-8 (T4)
 TN7277, 4 Pin Surface Mount (SM3)
 FP7277, 4 Pin Flatpack (FP4)
 BX7277, Connectrized Housing (H1)

Features

- High Output Power: +24 dBm Typical
- High Third Order Intercept: +41 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	10.5	9.5 Min.
Power @ 1 dB Comp. (dBm)	+24	+20.0 Min.
Reverse Isolation (dB)	- 12.5	- 11.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	4.0	5.0 Max.
Power Vdc	+15	+15
mA	70	75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

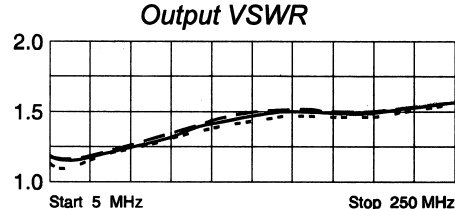
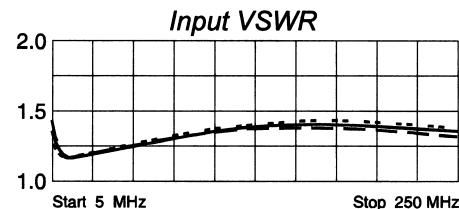
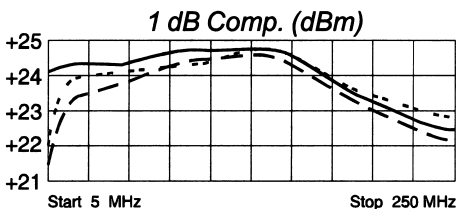
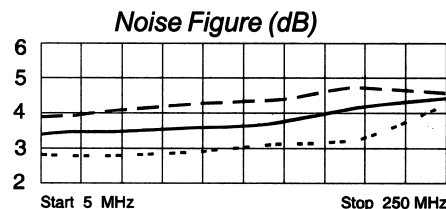
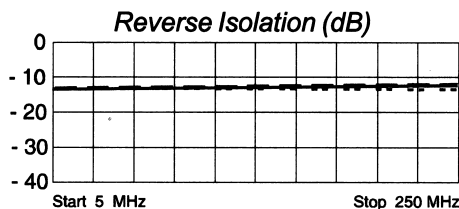
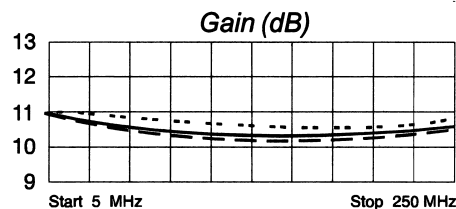
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +54(Typ.)
 Second Order Two Tone Intercept Point +48(Typ.)
 Third Order Two Tone Intercept Point +41(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power.....0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.15	-105	3.56	-170	.21	-173	.08	-93
10	.09	-118	3.53	-180	.22	179	.07	-125
50	.09	-122	3.43	152	.22	151	.11	-146
100	.14	-126	3.34	123	.22	122	.17	-177
150	.17	-132	3.32	96	.23	96	.20	142
200	.18	-134	3.32	67	.24	70	.21	93
250	.17	-130	3.37	38	.24	47	.24	38

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10/22/02

RF AMPLIFIER

MODEL *TM7278*

Available as: TM7278, 4 Pin TO-8 (T4)
 TN7278, 4 Pin Surface Mount (SM3)
 FP7278, 4 Pin Flatpack (FP4)
 BX7278, Connectorized Housing (H1)

Features

- High Output Power: +21.5 dBm Typical
- High Third Order Intercept: +36 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 300 MHz
Gain (dB)	13.5	12.5 Min.
Power @ 1 dB Comp. (dBm)	+21.5	+19.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4	5.5 Max.
Power Vdc	+15	+15
mA	65	75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

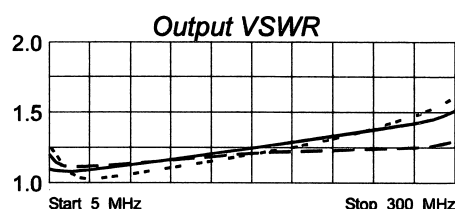
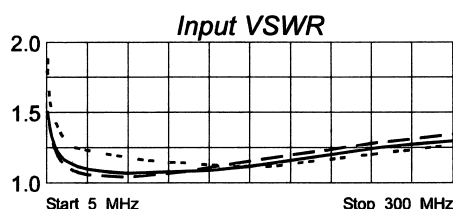
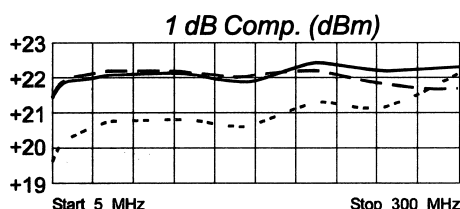
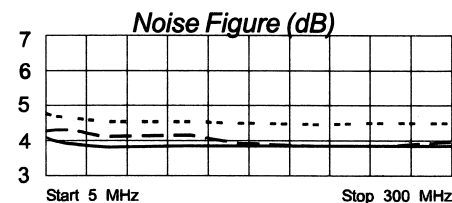
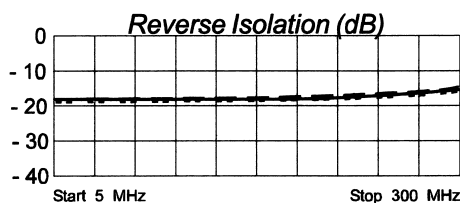
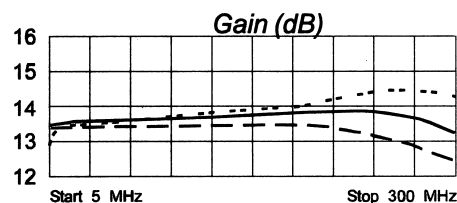
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
 Second Order Two Tone Intercept Point +49 (Typ.)
 Third Order Two Tone Intercept Point +36 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.20	-92	4.67	-162	.13	6	.07	135
20	.06	-140	4.80	178	.13	2	.05	174
50	.04	160	4.80	165	.13	2	.05	-159
100	.05	97	4.84	147	.14	3	.08	-149
150	.06	44	4.90	128	.14	2	.11	-161
200	.09	2	4.95	108	.15	2	.14	176
250	.12	-37	4.92	85	.16	-2	.16	137
300	.14	-72	4.61	59	.18	-7	.21	84

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RF AMPLIFIER

MODEL TM7279

Available as: TM7279, 4 Pin TO-8 (T4)
TN7279, 4 Pin Surface Mount (SM3)
FP7279, 4 Pin Flatpack (FP4)
BX7279, Connectorized Housing (H1)

Features

- High Output Power: +23 dBm Typical
- High Third Order Intercept: +36 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 300 MHz	5 - 250 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+23	+21.0 Min.
Reverse Isolation (dB)	- 15.5	- 14.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+15	+15
mA	88	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

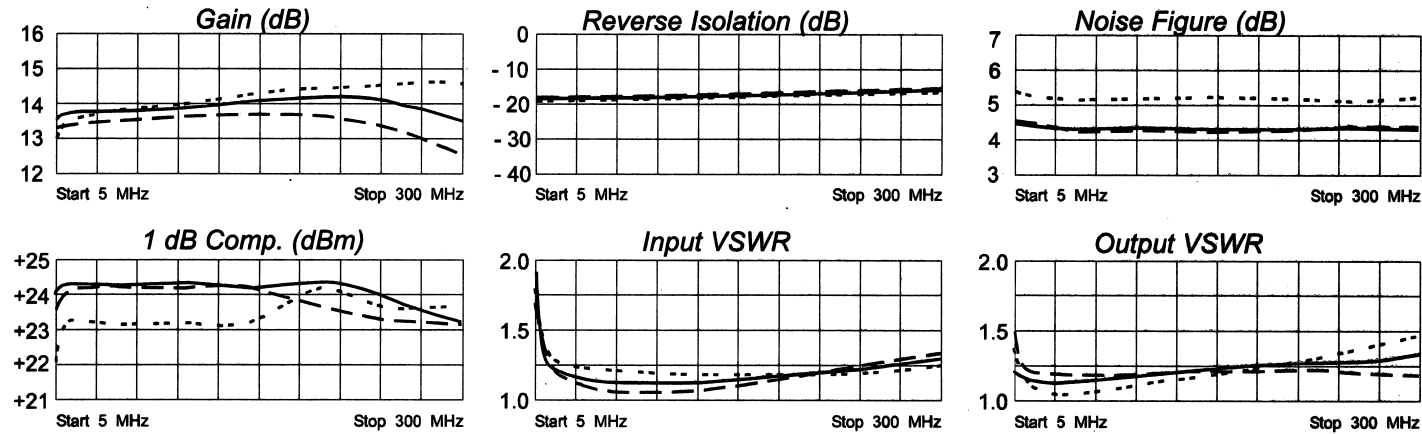
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52(Typ.)
Second Order Two Tone Intercept Point +46(Typ.)
Third Order Two Tone Intercept Point +36(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.22	-91	4.76	-160	.13	8	.09	137
20	.08	-140	4.92	179	.13	3	.07	171
50	.05	165	4.93	166	.13	2	.07	-173
100	.06	107	4.99	148	.13	2	.08	-161
150	.06	58	5.06	130	.14	1	.11	-166
200	.08	15	5.12	111	.15	0	.12	174
250	.11	-28	5.08	89	.16	-3	.14	142
300	.13	-65	4.76	64	.17	-9	.16	91

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RF AMPLIFIER

MODEL **TM7281**

Available as: TM7281, 4 Pin TO-8 (T4)
 TN7281, 4 Pin Surface Mount (SM3)
 FP7281, 4 Pin Flatpack (FP4)
 BX7281, Connectorized Housing (H1)

Features

- High Gain: 25.5 dB Typical
- Low Noise: 2.2 dB Typical
- Operating Temp. - 55°C to +85°C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	20 - 250 MHz
Gain (dB)	25.5	23.0 Min.
Power @ 1 dB Comp. (dBm)	+17.5	+15.5 Min.
Reverse Isolation (dB)	- 32	- 30 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.4	3.3 Max.
Power Vdc	+15	+15
mA	30	33 Max.

Note: Care should always be taken to effectively ground the case of each unit.

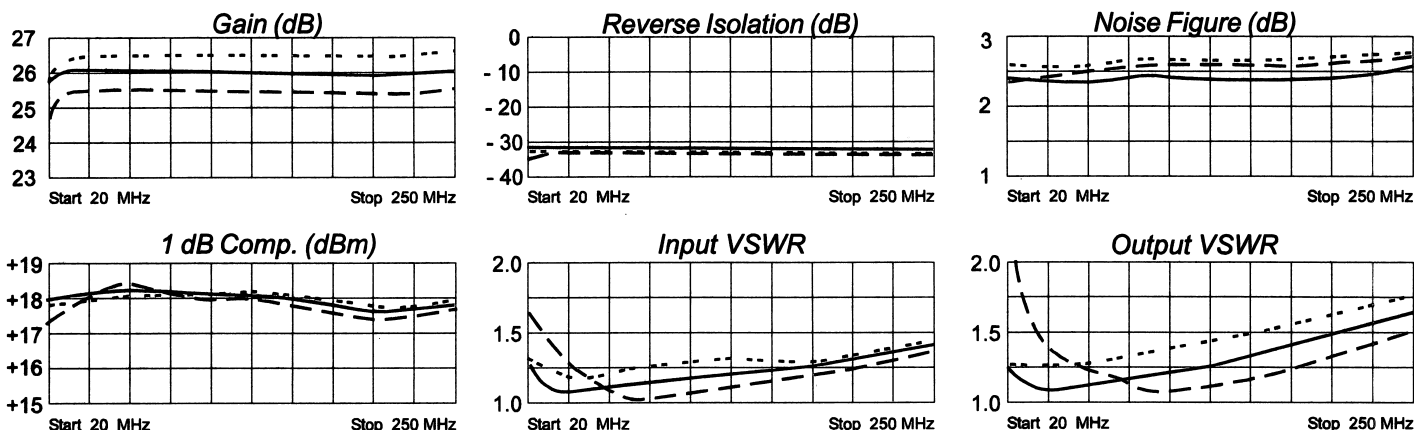
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.21	- 86	19.49	-162	.02	4	.10	77
20	.10	-104	19.91	-178	.02	2	.06	48
50	.02	175	20.13	161	.02	- 5	.04	- 12
100	.06	75	20.02	134	.02	- 10	.07	- 73
150	.11	47	19.92	109	.02	- 19	.12	-103
200	.14	23	19.79	84	.02	- 26	.17	-128
250	.18	- 4	19.83	59	.02	- 29	.22	-149
300	.21	- 32	19.96	32	.02	- 38	.27	-168

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RF AMPLIFIER

MODEL TM7282

Available as: TM7282, 4 Pin TO-8 (T4)
 TN7282, 4 Pin Surface Mount (SM3)
 FP7282, 4 Pin Flatpack (FP4)
 BX7282, Connectorized Housing (H1)

Features

- High Output Power: +21 dBm Typical
- High Gain: 23.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 250 MHz	20 - 250 MHz
Gain (dB)	23.5	21.0 Min.
Power @ 1 dB Comp. (dBm)	+21	+18.0 Min.
Reverse Isolation (dB)	- 28	- 27 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.3:1 Max.
Noise figure (dB)	4.0	5.0 Max.
Power Vdc	+15	+15
mA	45	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

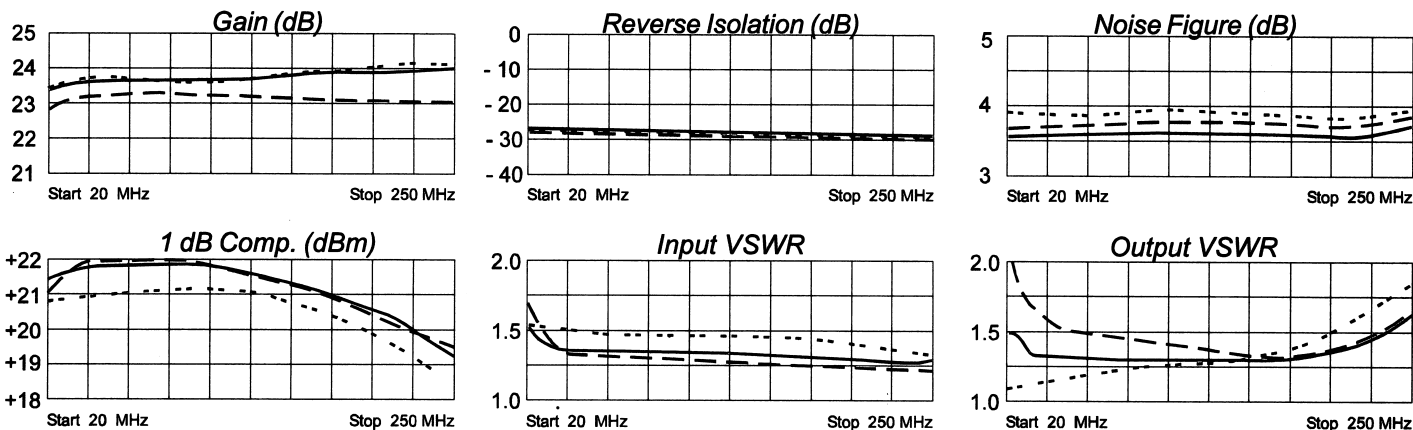
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.34	- 94	14.03	-148	.03	19	.34	112
20	.22	-128	14.93	-171	.03	6	.19	99
50	.16	-168	15.15	164	.03	- 5	.13	76
100	.15	157	15.21	136	.03	-13	.13	38
150	.13	127	15.31	111	.03	-23	.13	- 9
200	.12	91	15.46	84	.03	-38	.15	- 69
250	.10	40	15.34	56	.03	-51	.24	-129
300	.12	- 34	14.77	25	.02	-69	.41	-173

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RF AMPLIFIER

MODEL *TM7286*

Available as: TM7286, 4 Pin TO-8 (T4)
 TN7286, 4 Pin Surface Mount (SM3)
 FP7286, 4 Pin Flatpack (FP4)
 BX7286, Connectorized Housing (H1)

Features

- Low Noise: <2.5 dB Typical
- Medium Output Power: >+8 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	10 - 200 MHz
Gain (dB)	28	26.0 Min.
Power @ 1 dB Comp. (dBm)	+8	+7.0 Min.
Reverse Isolation (dB)	- 38.5	- 37 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.5 Max.
Power Vdc	+5	+5
mA	21	24 Max.

Note: Care should always be taken to effectively ground the case of each unit.

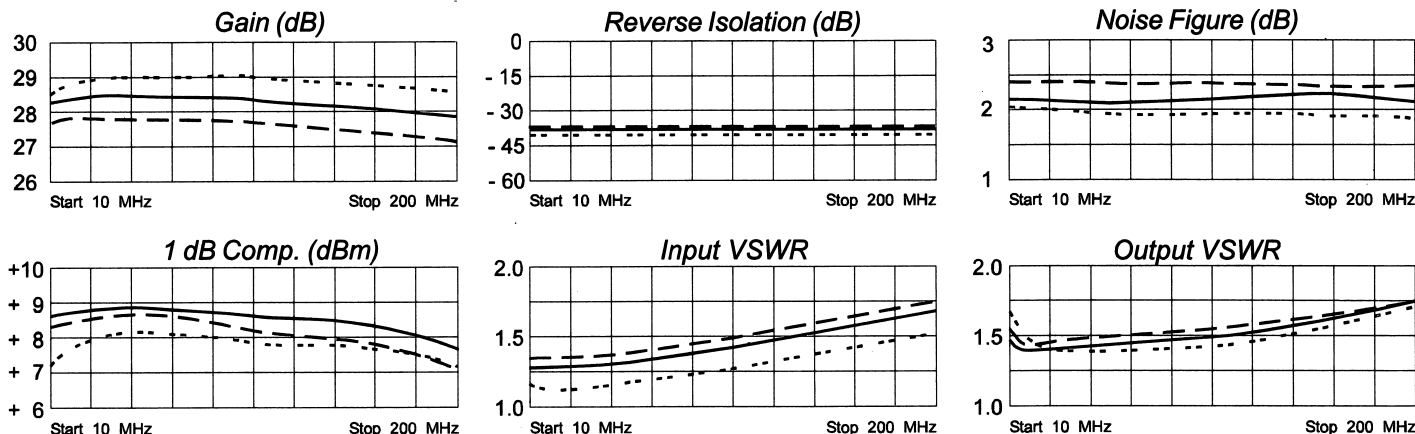
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +34 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	27	25.53	11	.01	21	.24	160
10	.13	17	25.96	2	.02	1	.19	164
50	.14	16	26.09	- 28	.01	- 4	.17	-176
100	.18	22	25.93	- 58	.01	-16	.19	-165
150	.22	24	25.16	- 88	.01	4	.23	-159
200	.25	18	24.27	-119	.00	57	.29	-158
250	.31	12	22.40	-150	.01	-32	.34	-162

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RF AMPLIFIER

MODEL *TM7287*

Available as: TM7287, 4 Pin TO-8 (T4)
 TN7287, 4 Pin Surface Mount (SM3)
 FP7287, 4 Pin Flatpack (FP4)
 BX7287, Connectorized Housing (H1)

Features

- High Efficiency: 70 mW D.C. with > +10 dBm Output
- Low Noise Figure: 3.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	10 - 300 MHz
Gain (dB)	15.5	14.5 Min.
Power @ 1 dB Comp. (dBm)	+10	+9.0 Min.
Reverse Isolation (dB)	- 20	- 19 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.75	4.0 Max.
Power Vdc mA	+5 14.5	+5 16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

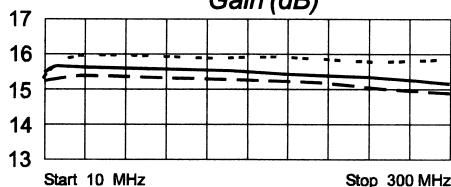
Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

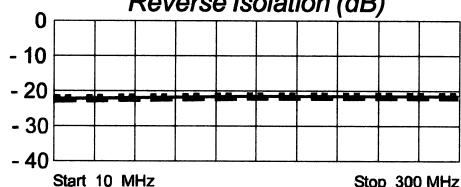
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

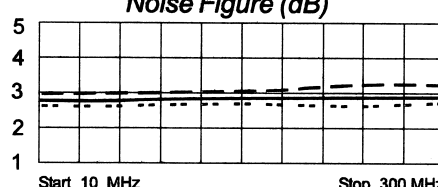
Gain (dB)



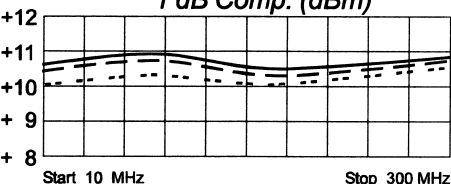
Reverse Isolation (dB)



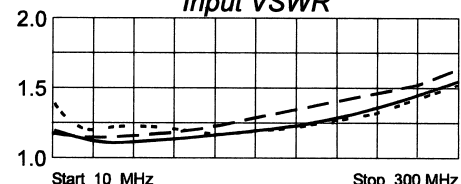
Noise Figure (dB)



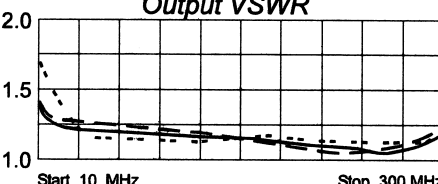
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.08	-100	6.00	-177	.09	5	.14	153
50	.04	-139	6.10	162	.09	-10	.09	171
100	.04	-112	6.07	141	.10	-21	.08	-179
200	.12	-106	5.96	101	.10	-46	.05	-144
300	.23	-147	5.85	57	.10	-75	.10	- 42

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RF AMPLIFIER

MODEL *TM7288*

Available as: TM7288, 4 Pin TO-8 (T4)
 TN7288, 4 Pin Surface Mount (SM3)
 FP7288, 4 Pin Flatpack (FP4)
 BX7288, Connectorized Housing (H1)

Features

- Low Noise Figure: 1.8 dB Typical
- Medium Output Power: +7.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 250 MHz
Gain (dB)	22	21 Min.
Power @ 1 dB Comp. (dBm)	+7.5	+6.5 Min.
Reverse Isolation (dB)	- 23	- 22 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	1.8	2.2 Max.
Power Vdc	+15	+15
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

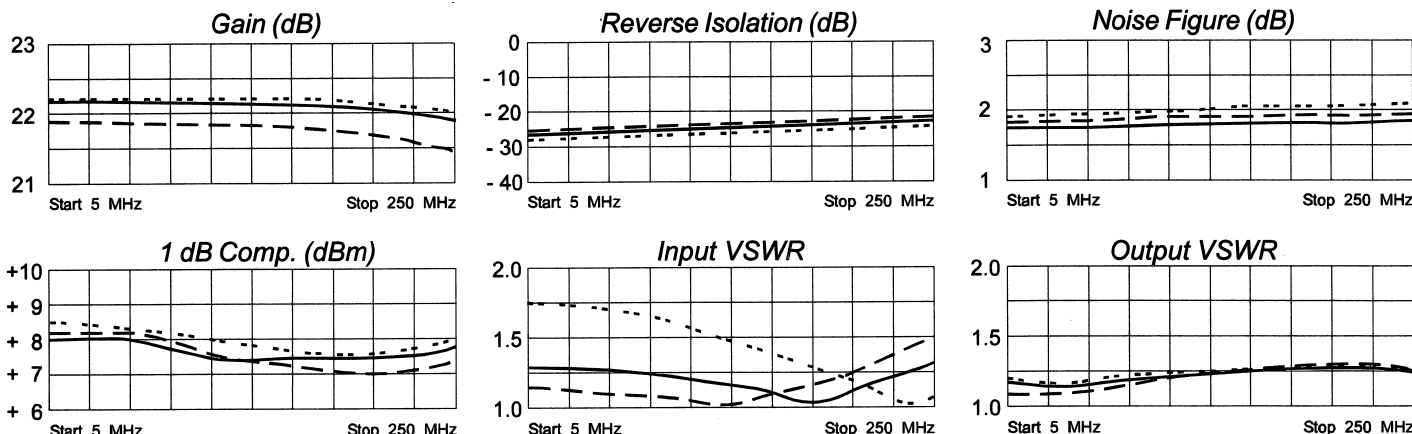
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +29 (Typ.)
 Second Order Two Tone Intercept Point +23 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	-176	12.66	-179	.05	4	.08	-172
10	.12	-180	12.68	177	.05	3	.08	-174
50	.11	162	12.68	161	.05	2	.08	-167
100	.08	140	12.60	141	.06	4	.09	-159
150	.04	110	12.53	121	.06	3	.11	-161
200	.05	- 49	12.51	100	.06	- 1	.12	-172
250	.14	- 78	12.27	77	.07	- 5	.10	162

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RF AMPLIFIER

MODEL TM7347

Available as: TN7347, 4 Pin TO-8 (T4)
 TN7347, 4 Pin Surface Mount (SM3)
 FP7347, 4 Pin Flatpack (FP4)
 BX7347, Connectorized Housing (H1)
 PN7347, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 2.0dB Typical
- Medium Output: +16dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5-300 MHz	5-300 MHz
Gain (dB)	13.5	12.5 Min.
Power @ 1 dB Comp. (dBm)	+16.0	-22 Min.
Reverse Isolation (dB)	-22	-21 Max.
VSWR In	<1.5:1	1.7:1 Max.
Out	<1.5:1	1.5:1 Max.
Noise figure (dB)	2.0	3.0 Max.
Power Vdc	+15	+15
mA	45	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

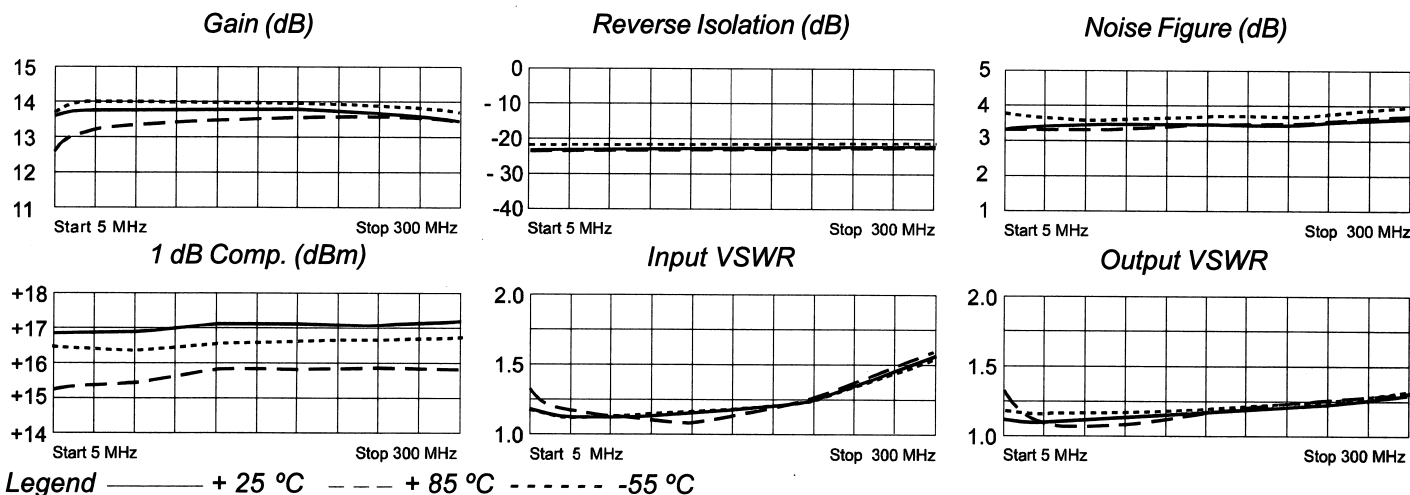
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power +13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	---S11---	---S21---	---S12---	---S22---
	Mag Deg	Mag Deg	Mag Deg	Mag Deg
5	.19 -98	4.72 -159	.076 -158	-27
20	.10 -150	4.92 179	.076 178	-18
50	.09 -168	4.92 170	.077 171	- 9
100	.08 -173	4.93 156	.077 157	- 7
150	.07 -162	4.92 142	.077 145	-13
200	.07 -141	4.93 129	.077 129	-13
250	.11 -135	4.93 116	.076 117	24
300	.16 -141	4.88 102	.077 107	55

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RF AMPLIFIER

MODEL *TM7370*

Available as: TM7370, 4 Pin TO-8 (T4)
 TN7370, 4 Pin Surface Mount (SM3)
 FP7370, 4 Pin Flatpack (FP4)
 BX7370, Connectorized Housing (H1)

Features

- High Output Power: +23 dBm Typical
- Low Noise: 1.9 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 250 MHz	20 - 250 MHz
Gain (dB)	8.5	7.3 Min.
Power @ 1 dB Comp. (dBm)	+23	+20.0 Min.
Reverse Isolation (dB)	- 11.0	- 10.5 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.35:1	2.0:1 Max.
Noise figure (dB)	1.9	3.4 Max.
Power Vdc	+15	+15
mA	45	48 Max.

Note: Care should always be taken to effectively ground the case of each unit.

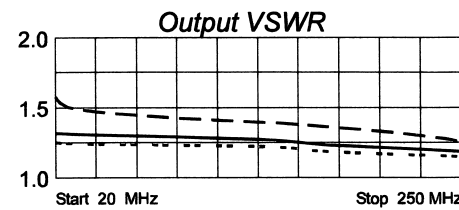
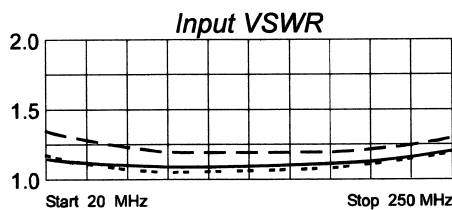
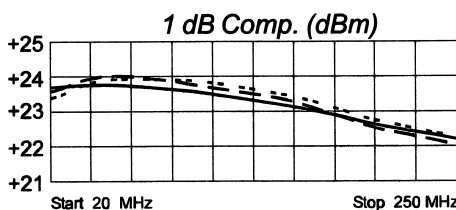
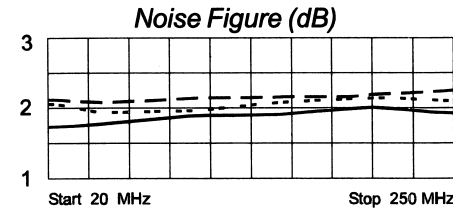
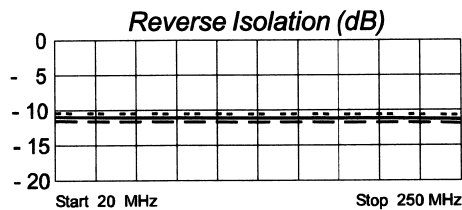
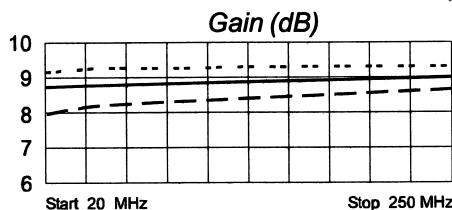
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
 Second Order Two Tone Intercept Point +49 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.10	126	2.72	6	.27	6	.17	151
50	.05	145	2.73	-10	.27	-10	.13	151
100	.04	155	2.73	-23	.27	-24	.13	133
150	.04	167	2.72	-36	.27	-36	.12	117
200	.05	-179	2.74	-48	.27	-50	.11	104
250	.08	-171	2.75	-61	.27	-62	.10	102
300	.14	-177	2.75	-75	.26	-76	.08	112

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RF AMPLIFIER

MODEL *TM7371*

Available as: TM7371, 4 Pin TO-8 (T4)
 TN7371, 4 Pin Surface Mount (SM3)
 FP7371, 4 Pin Flatpack (FP4)
 BX7371, Connectorized Housing (H1)

Features

- Low Noise Figure: < 2.0 dB Typical
- High Gain: 18 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	1 - 300 MHz	5 - 250 MHz
Gain (dB)	18	16.0 Min.
Power @ 1 dB Comp. (dBm)	+2	+1.0 Min.
Reverse Isolation (dB)	- 21	- 20 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	1.75	2.5 Max.
Power Vdc	+15	+15
mA	9	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

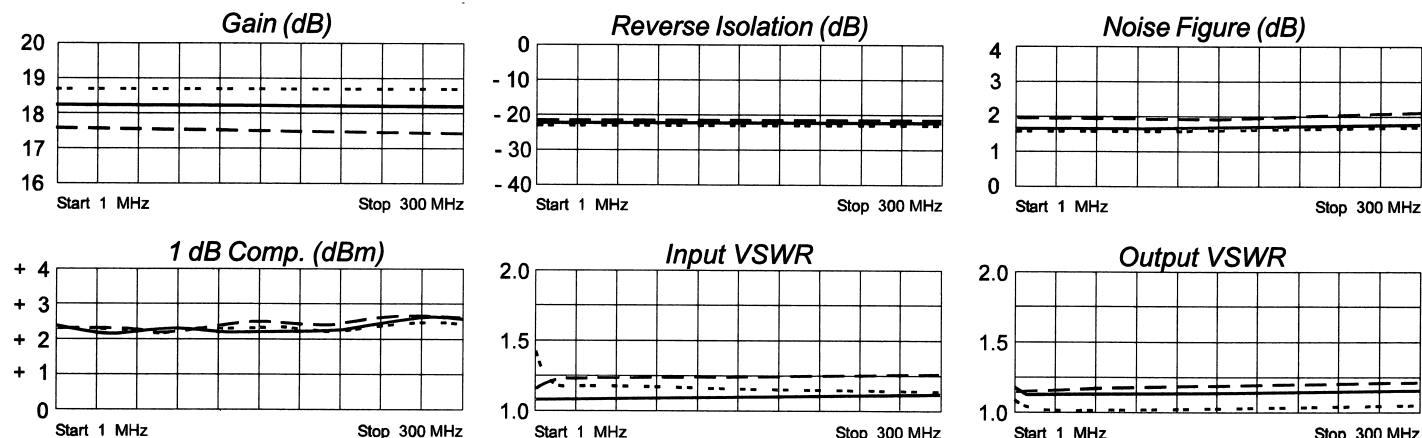
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +20 (Typ.)
 Second Order Two Tone Intercept Point +15 (Typ.)
 Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
1	.06	- 92	8.31	-165	.08	18	.07	- 88
5	.02	- 14	8.35	-178	.08	4	.03	- 17
50	.02	- 6	8.32	170	.08	- 0	.03	- 5
100	.03	- 18	8.29	159	.08	- 0	.03	-23
150	.03	- 27	8.28	149	.08	- 4	.04	-37
200	.04	- 38	8.26	138	.08	- 4	.04	-47
250	.04	- 52	8.27	127	.08	- 5	.05	-64
300	.05	- 74	8.25	117	.08	- 7	.05	-76

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RF AMPLIFIER

MODEL *TM7379*

Available as: TM7379, 4 Pin TO-8 (T4)
 TN7379, 4 Pin Surface Mount (SM3)
 FP7379, 4 Pin Flatpack (FP4)
 BX7379, Connectorized Housing (H1)

Features

- High Output Power: +23 dBm Typical
- Medium Gain: 14 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 250 MHz	5 - 200 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+23	+21.0 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+12	+12
mA	88	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

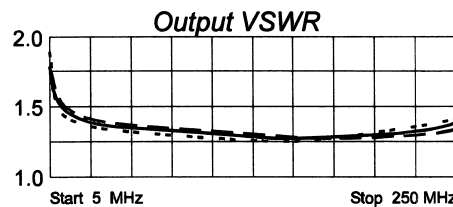
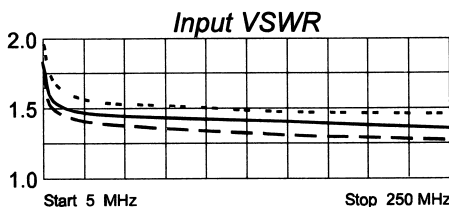
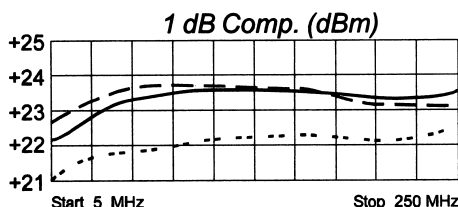
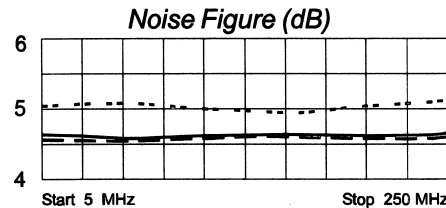
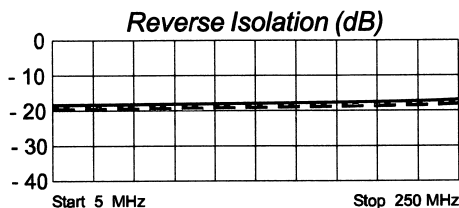
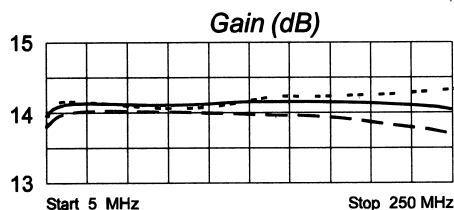
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +47 (Typ.)
 Third Order Two Tone Intercept Point +38 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 15 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.29	-117	4.97	-159	.12	19	.28	142
10	.21	-145	5.04	-172	.12	10	.20	151
50	.18	169	5.08	166	.12	5	.15	160
100	.18	145	5.07	149	.13	6	.13	149
150	.17	124	5.09	132	.14	6	.12	147
200	.16	107	5.10	114	.15	5	.12	151
250	.14	89	5.02	96	.16	3	.16	154

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RF AMPLIFIER

MODEL *TM7380*

Available as: TM7380, 4 Pin TO-8 (T4)
 TN7380, 4 Pin Surface Mount (SM3)
 FP7380, 4 Pin Flatpack (FP4)
 BX7380, Connectorized Housing (H1)

Features

- High Gain: 27.5 dB Typical
- Low Noise: 2.2 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 200 MHz	10 - 200 MHz
Gain (dB)	27.5	26.0 Min.
Power @ 1 dB Comp. (dBm)	+17.0	+15.0 Min.
Reverse Isolation (dB)	- 32	- 31 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.2	3.0 Max.
Power Vdc	+15	+15
mA	28	32 Max.

Note: Care should always be taken to effectively ground the case of each unit.

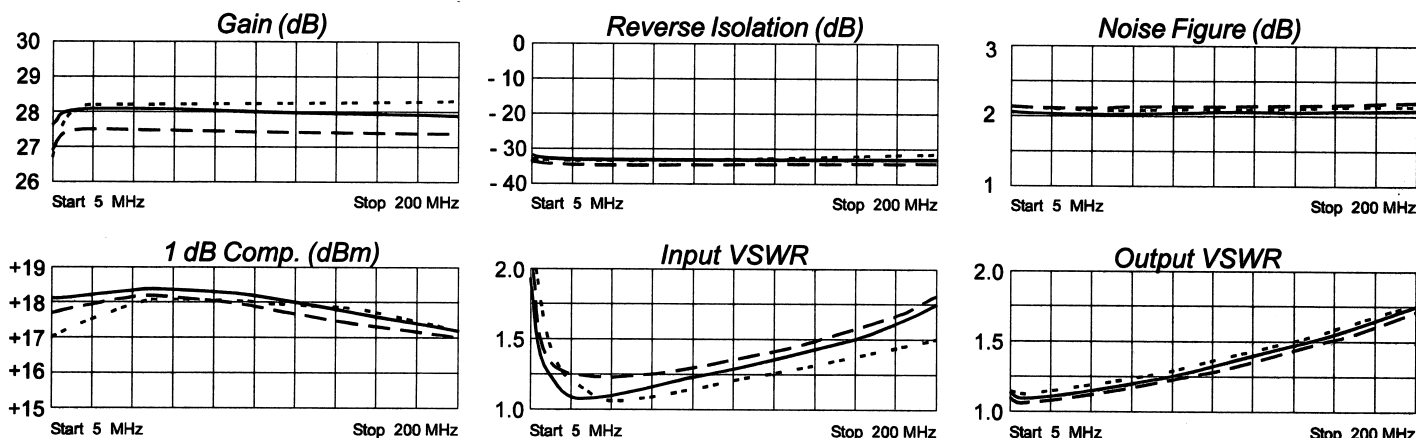
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.31	- 87	24.07	-156	.03	- 4	.12	- 89
10	.17	-113	25.12	-172	.02	- 4	.10	-131
50	.08	140	25.31	156	.02	- 7	.08	-165
100	.12	83	25.12	128	.02	-12	.08	-152
150	.18	43	25.05	100	.02	-23	.13	-138
200	.26	9	25.03	72	.02	-33	.21	-145
250	.35	- 25	25.22	42	.02	-48	.28	-158

Amplifonix

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RF AMPLIFIER

MODEL *TM7382*

Available as: TM7382, 4 Pin TO-8 (T4)
 TN7382, 4 Pin Surface Mount (SM3)
 FP7382, 4 Pin Flatpack (FP4)
 BX7382, Connectorized Housing (H1)

Features

- High Reverse Isolation: -32 dB Typical
- High Output Power: +18 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	20 - 300 MHz	20 - 250 MHz
Gain (dB)	18	16.0 Min.
Power @ 1 dB Comp. (dBm)	+17.5	+16.0 Min.
Reverse Isolation (dB)	- 32	- 30.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.2:1	1.4:1 Max.
Noise figure (dB)	4.0	5.0 Max.
Power Vdc	+15	+15
mA	45	53 Max.

Note: Care should always be taken to effectively ground the case of each unit.

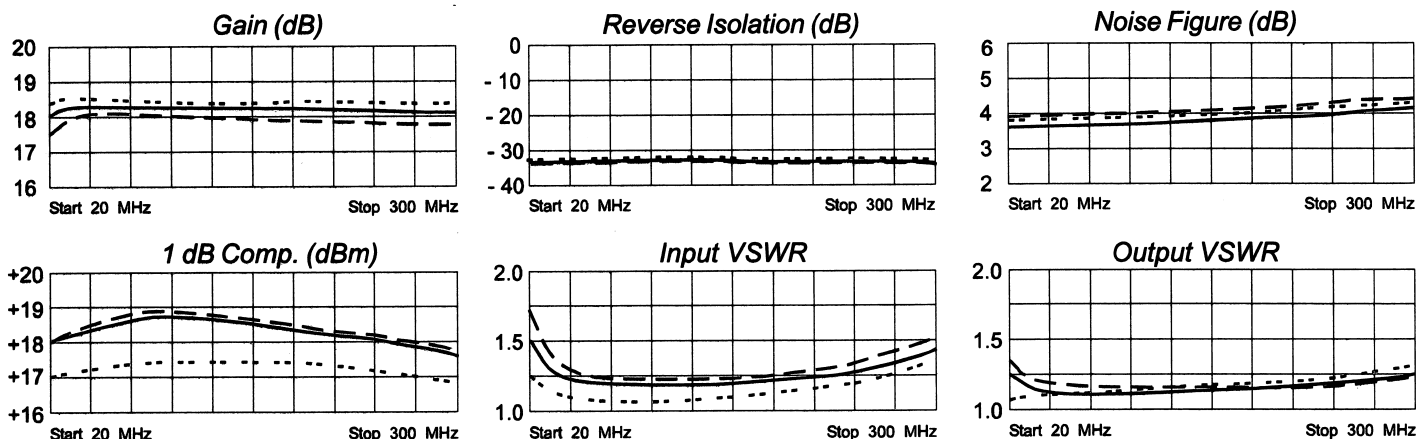
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +31 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
20	.20	-66	7.99	-167	.02	11	.11	87
50	.10	-66	8.22	167	.02	- 0	.07	52
100	.07	-67	8.20	141	.02	-16	.06	20
150	.08	-70	8.16	118	.02	-17	.07	- 11
200	.10	-72	8.13	95	.02	-28	.07	- 44
250	.15	-81	8.11	72	.02	-41	.08	- 99
300	.21	-94	8.00	46	.01	-65	.13	-146

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RF AMPLIFIER

MODEL *TM7481*

Available as: TM7481, 4 Pin TO-8 (T4)
 TN7481, 4 Pin Surface Mount (SM3)
 FP7481, 4 Pin Flatpack (FP4)
 BX7481, Connectorized Housing (H1)
 PN7481, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 2.3 dB Typical
- Medium Output Power: 16.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 300 MHz	15 - 300 MHz
Gain (dB)	28.0	27.0 Min
Power @ 1 dB Comp. (dBm)	+16.5	+15.0 Min.
Reverse Isolation (dB)	32	Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	2.3	3.0 Max.
Power Vdc	+15	+15
mA	27.0	32.0 Max.

Note: Care should always be taken to effectively ground the case of each unit.

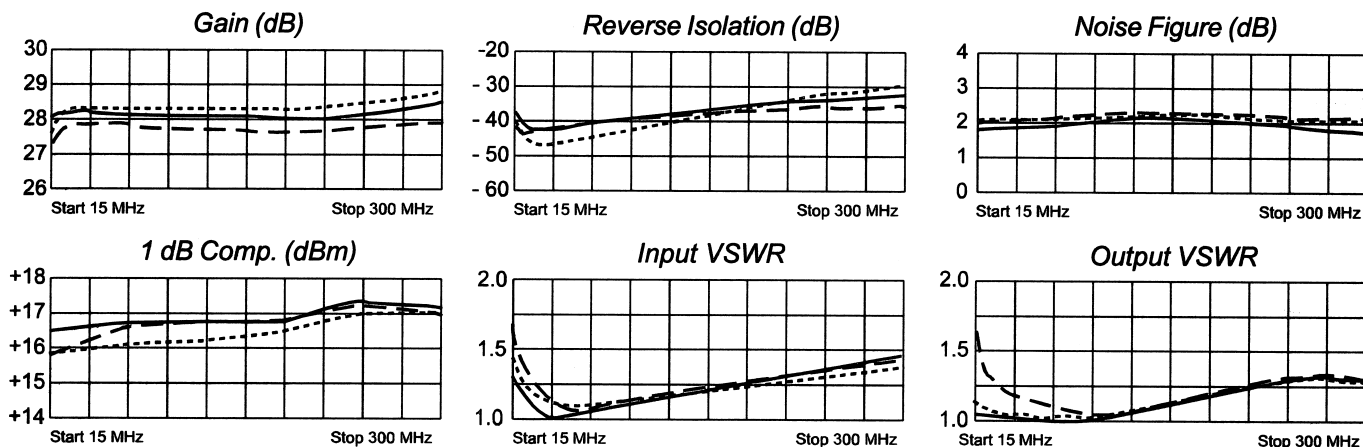
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---- S11 ----		---- S21 ----		---- S12 ----		---- S22 ----	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
15	.25	- 80	25.44	- 163	.0220	- 2	.04	
50	.02	95	26.48	158	.0213	- 3	.03	
100	.12	57	26.03	129	.0223	- 7	.04	
150	.19	35	25.57	103	.0231	- 11	.09	
200	.25	13	25.36	77	.0233	- 21	.15	
250	.29	- 11	25.61	50	.0232	- 30	.19	
300	.33	- 41	26.53	21	.0231	- 37	.21	

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RF AMPLIFIER

MODEL *TM7487*

Available as: TM7487, 4 Pin TO-8 (T4)
 TN7487, 4 Pin Surface Mount (SM3)
 FP7487, 4 Pin Flatpack (FP4)
 BX7487, Connectorized Housing (H1)

Features

- Low Noise Figure: <3 dB Typical
- Low Power Dissipation: 65 mW @ +5 Volts
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 350 MHz	10 - 300 MHz
Gain (dB)	15.5	14.5 Min.
Power @ 1 dB Comp. (dBm)	+ 8	+ 7.0 Min.
Reverse Isolation (dB)	- 20	- 19 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3	4.0 Max.
Power Vdc	+5	+5
mA	13	14.5 Max.

Note: Care should always be taken to effectively ground the case of each unit.

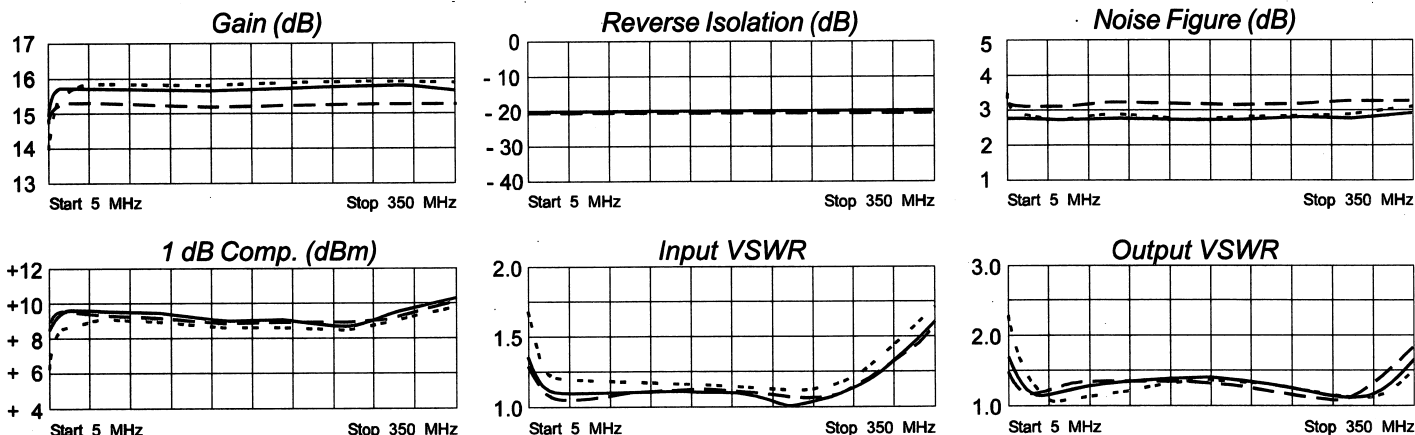
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.19	-72	5.47	-163	.08	18	.27	144
10	.10	-86	5.76	-173	.09	9	.18	142
50	.02	173	6.00	164	.09	-8	.09	-174
100	.04	100	5.99	145	.09	-19	.12	-153
150	.04	61	5.95	127	.10	-30	.15	-156
200	.02	26	5.96	108	.10	-40	.15	-168
250	.03	-136	6.00	89	.10	-53	.10	170
300	.11	-167	6.04	67	.10	-67	.04	58
350	.23	165	5.97	42	.10	-86	.21	-13

Amplifonix

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RF AMPLIFIER MODEL CZ8110

Available as: CZ8110, 3 Pin TO-39 (T10) Pg. 9-10
 TN8110-3, 4 Pin Surface Mount (SM3) Pg. 9-8
 FP8110-4, 4 Pin Flatpack (FP4) Pg. 9-3
 BX8110, Connectorized Housing (H1) Pg. 9-6
 PN8110, Reduced Size Surface Mount (SM11) Pg. 9-8

Features

- Low Cost; Medium Gain: 15 dB Typical
- Low Noise Figure: <4 dB Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 400 MHz	KHz - 400 MHz
Gain (dB)	15	13.0 Min.
Power @ 1 dB Comp. (dBm)	- 0.2	- 5.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.5:1	2.5:1 Max.
Out	<2.0:1	2.5:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+3	+3
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C.

Second Order Harmonic Intercept Point +15 (Typ.)
 Second Order Two Tone Intercept Point + 8 (Typ.)
 Third Order Two Tone Intercept Point +10 (Typ.)

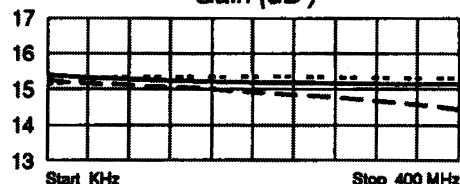
Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C
 Storage Temperature - 62 °C to + 125 °C
 Case Temperature + 125 °C
 DC Current 25 mA
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 25 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.25 Watt
 (3 µsec Max.)

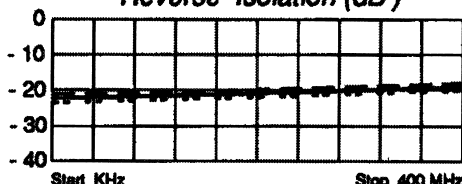
* Decoupling Impedance is 1 Kohm

Typical Performance Data

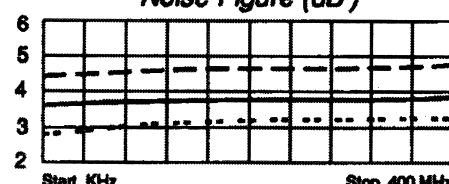
Gain (dB)



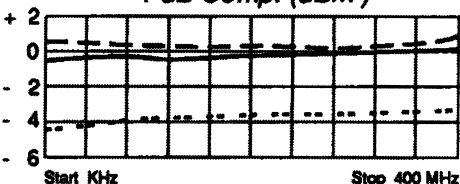
Reverse Isolation (dB)



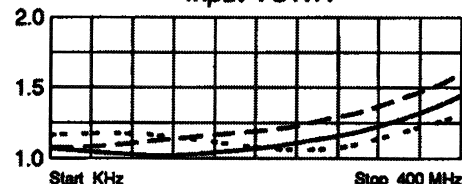
Noise Figure (dB)



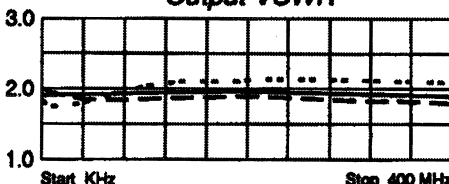
1 dB Comp. (dBm)



Input VSWR



Output VSWR

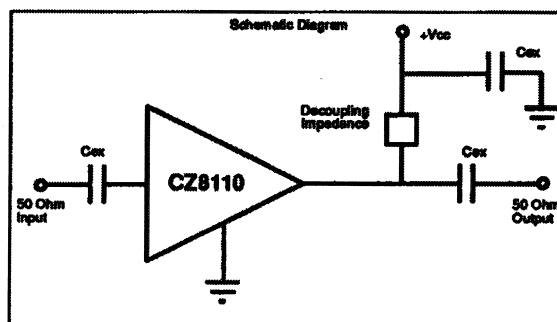


Legend ——— + 25 °C - - - - + 125 °C - 55 °C

The CZ81X0 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedances. The external capacitors determine the low frequency response of the Amplifier.

The CZ81X0 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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Rev. A 07/12/93

RF AMPLIFIER MODEL CZ8120

Available as: CZ8120, 3 Pin TO-39 (T10)

TN8120-3, 4 Pin Surface Mount (SM3)

FP8120-4, 4 Pin Flatpack (FP4)

BX8120, Connectorized Housing (H1)

PN8120, Reduced Size Surface Mount (SM11)

Pg. 9-1

Pg. 9-8

Pg. 9-3

Pg. 9-6

Pg. 9-8

Features

- Low Cost; Medium Gain: 15 dB Typical
- Medium Output Power: +8 dBm Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 400 MHz	KHz - 400 MHz
Gain (dB)	15	13.0 Min.
Power @ 1 dB Comp. (dBm)	+9	+7.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In Out	<2.0:1 <2.2:1	2.5:1 Max. 2.5:1 Max.
Noise figure (dB)	<5.0	6.5 Max.
Power Vdc mA	+5 25	+5 28 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +31 (Typ)

Second Order Two Tone Intercept Point +25 (Typ)

Third Order Two Tone Intercept Point +21 (Typ)

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C

Storage Temperature - 62 °C to + 125 °C

Case Temperature + 125 °C

DC Current 55 mA

Continuous RF Input Power + 13 dBm

Short Term RF Input Power 50 Milliwatts

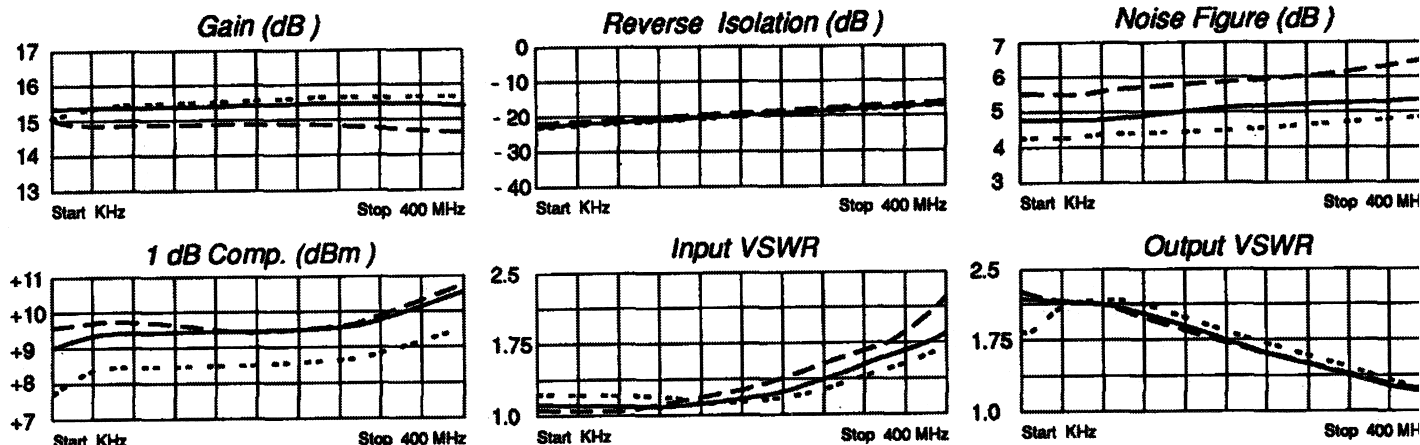
(1 Minute Max.)

Maximum Peak Power 0.5 Watts

(3 μsec Max.)

* Decoupling Impedance is 1 Kohm

Typical Performance Data

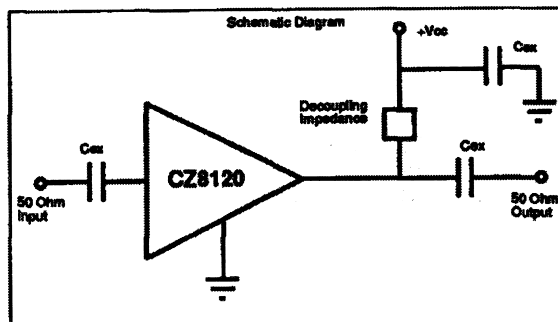


Legend ——— + 25 °C - - - - + 125 °C - 55 °C

The CZ81X0 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ81X0 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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Rev. A 07/13/93

RF AMPLIFIER MODEL CZ8130

Available as: CZ8130, 3 Pin TO-39 (T10) Pg. 9-10
 TN8130-3, 4 Pin Surface Mount (SM3) Pg. 9-8
 FP8130-4, 4 Pin Flatpack (FP4) Pg. 9-3
 BX8130, Connectorized Housing (H1) Pg. 9-6
 PN8130, Reduced Size Surface Mount (SM11) Pg. 9-8

Features

- Low Cost; Medium Gain: 14 dB Typical
- High Output Power: + 18 dBm Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 400 MHz	KHz - 400 MHz
Gain (dB)	14	13.0 Min.
Power @ 1 dB Comp. (dBm)	+18	+15.0 Min.
Reverse Isolation (dB)	- 20	- 15.5 Max.
VSWR In	<2.25:1	3.0:1 Max.
Out	<2.0:1	2.5:1 Max.
Noise figure (dB)	<6.0	7.0 Max.
Power Vdc	+5.75	+5.75
mA	60	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C.

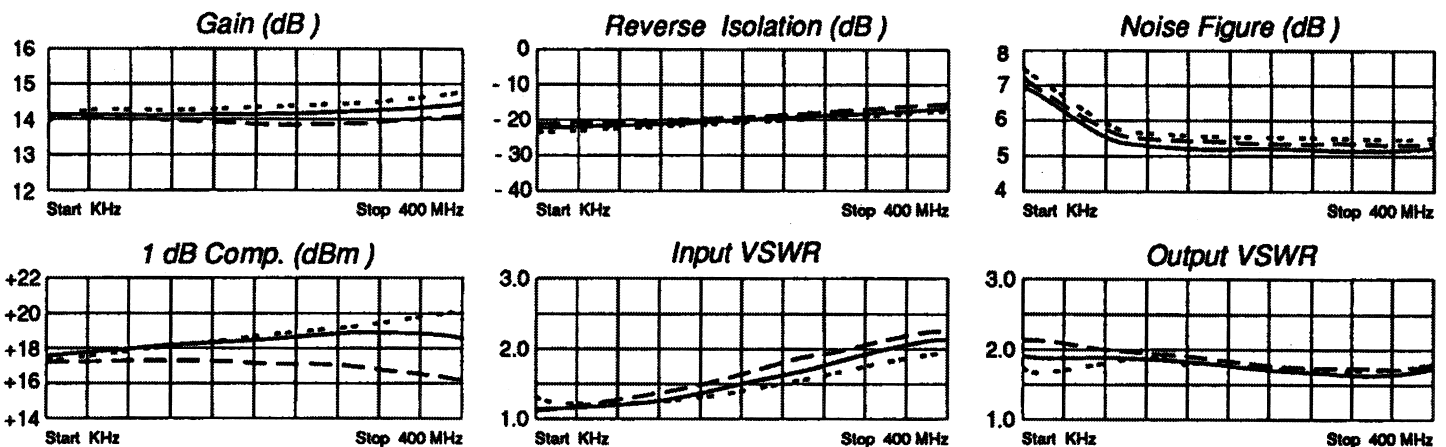
Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C
 Storage Temperature - 62 °C to + 125 °C
 Case Temperature + 125 °C
 DC Current 100 mA
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Decoupling Impedance is 330 Ohms

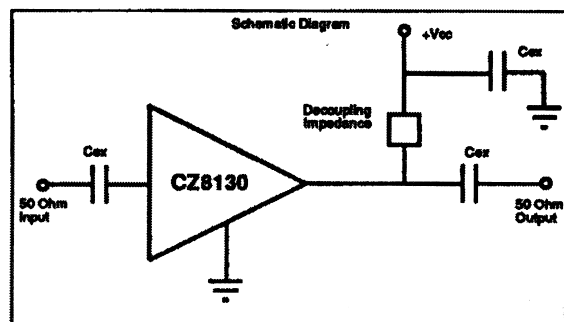
Typical Performance Data



The CZ8130 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ8130 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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Rev. B 04/08/93

RF AMPLIFIER

MODEL CZ8203

Available as: CN8203, 4 Pin Surface Mount (SM3)

Features

- High Gain: 20 dB Typical
- Medium Output Power: +9.5 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 200 MHz	5 - 200 MHz
Gain (dB)	20	19.0 Min.
Power @ 1 dB Comp. (dBm)	+9.5	+8.0 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	6.0	7.0 Max.
Power Vdc	+15	+15
mA	62	66 Max.

Note: Care should always be taken to effectively ground the case of each unit.

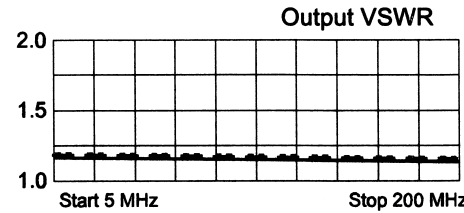
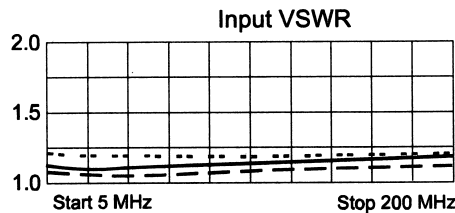
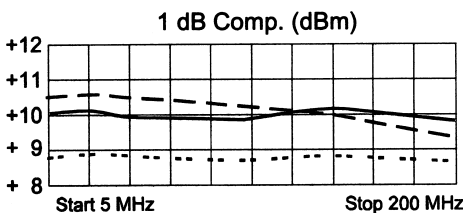
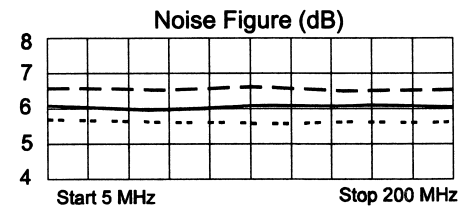
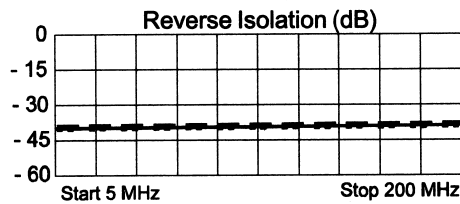
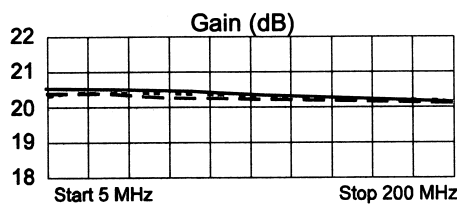
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +39 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.04	-164	10.66	3	.01	6	.06	-17
25	.04	-168	10.64	-7	.01	-5	.06	-7
50	.04	-162	10.61	-15	.01	9	.06	-6
100	.05	-145	10.50	-31	.01	8	.06	-7
150	.06	-134	10.32	-46	.01	17	.06	-10
200	.08	-127	10.14	-62	.01	18	.06	-11

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RF AMPLIFIER

MODEL CZ8205

Available as: CZ8205, 4 Pin Surface Mount (SM3)

Features

- Low Cost: 14 dB Gain Typical
- High Output Power: +21 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 200 MHz	5 - 200 MHz
Gain (dB)	13.5	12.0 Min.
Power @ 1 dB Comp. (dBm)	+21	+19.0 Min.
Reverse Isolation (dB)	- 20	- 18 Max.
VSWR In	<1.75:1	2.5:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	6.0	7.0 Max.
Power Vdc	+15	+15
mA	95	105 Max.

Note: Care should always be taken to effectively ground the case of each unit.

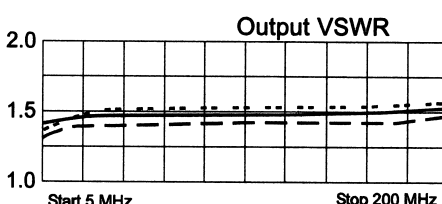
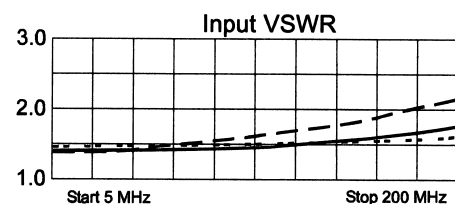
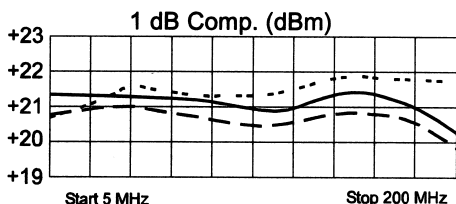
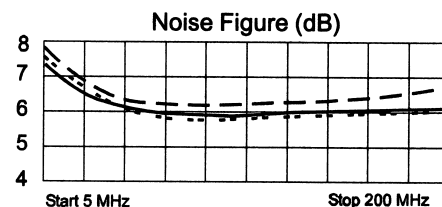
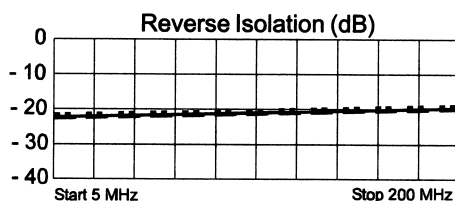
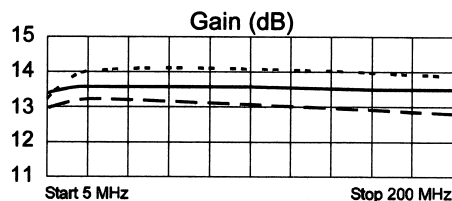
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +35 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.14	-153	4.68	-172	.08	10	.14	47
25	.16	-167	4.99	176	.08	4	.18	- 0
50	.16	-164	5.01	167	.08	4	.18	- 18
100	.19	-159	5.03	152	.09	6	.18	- 46
150	.22	-153	5.04	138	.09	7	.19	- 73
200	.26	-151	5.03	123	.10	8	.20	-102
250	.31	-152	5.02	108	.11	8	.23	-132

Amplifonix

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RF AMPLIFIER

MODEL CZ8206

Available as: CN8206, 4 Pin Surface Mount (SM3)

Features

- 12 Volt Operation; High Gain: 32 dB Typical
- Low Noise Figure: <3.5 dB Typical

Specifications

CHARACTERISTIC	TYPICAL		MIN/MAX	
	Ta = 25 °C		Ta = -55 °C to +85 °C	
Frequency	5 - 200 MHz		5 - 200 MHz	
Gain (dB)	32		30.0	Min.
Power @ 1 dB Comp. (dBm)	+3.5		+1.0	Min.
Reverse Isolation (dB)	- 42		- 40	Max.
VSWR In	<1.75:1		2.0:1	Max.
VSWR Out	<1.75:1		2.0:1	Max.
Noise figure (dB)	<3.5		4.0	Max.
Power Vdc	+12		+12	
mA	30		35	Max.

Note: Care should always be taken to effectively ground the case of each unit.

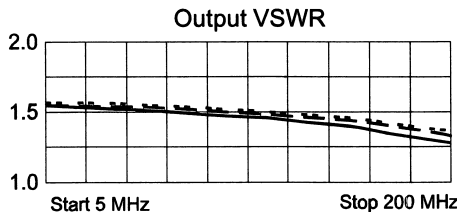
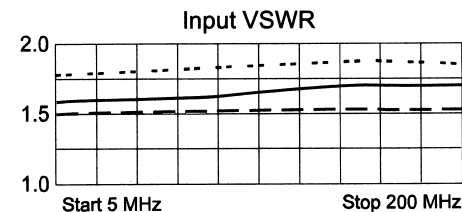
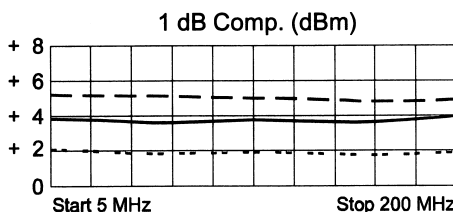
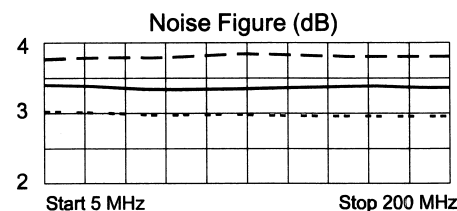
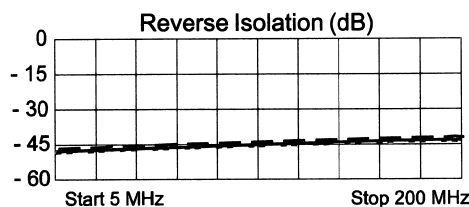
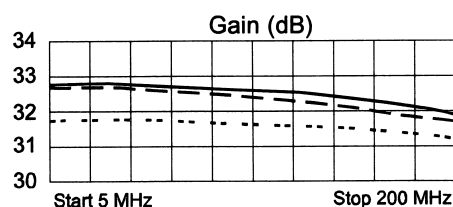
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +32 (Typ.)
 Second Order Two Tone Intercept Point +26 (Typ.)
 Third Order Two Tone Intercept Point +15 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.22	-170	43.97	3	.01	36	.21	- 3
50	.23	-176	43.71	- 22	.01	24	.21	- 12
100	.24	-176	42.78	- 45	.01	- 18	.19	- 14
150	.26	-174	41.88	- 67	.01	5	.18	- 31
200	.25	-179	39.53	- 90	.01	30	.13	- 31
250	.26	-177	36.66	-112	.01	30	.10	- 31
300	.25	-175	33.40	-134	.01	54	.05	- 18

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RF AMPLIFIER

MODEL CZ8207

Available as: CN8207, 4 Pin Surface Mount (SM3)

Features

- 5 Volt Operation
- High Gain: 18 dB Typical

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 200 MHz	5 - 200 MHz
Gain (dB)		18	17.0 Min.
Power @ 1 dB Comp. (dBm)		+4	0 Min.
Reverse Isolation (dB)		- 25	- 24 Max.
VSWR	In Out	<1.25:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		<4.0	5.0 Max.
Power	Vdc mA	+5 17	+5 21 Max.

Note: Care should always be taken to effectively ground the case of each unit.

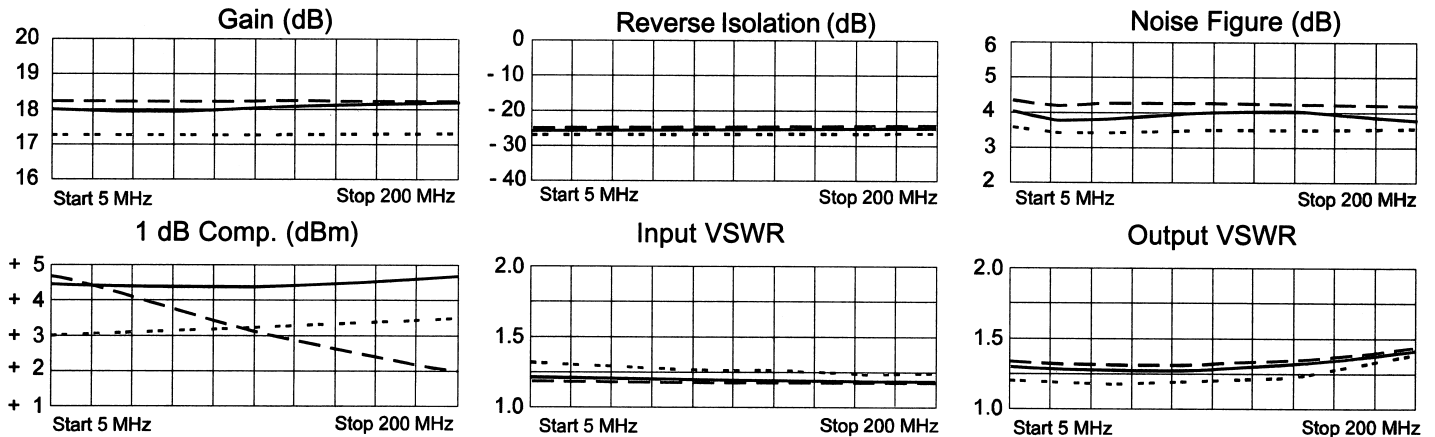
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +23 (Typ.)
 Second Order Two Tone Intercept Point +17 (Typ.)
 Third Order Two Tone Intercept Point +15 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.09	-167	7.89	-178	.05	3	.12	-170
25	.09	179	7.87	174	.05	2	.12	-177
50	.09	176	7.88	167	.05	0	.12	-175
100	.08	174	7.91	153	.05	3	.12	-173
150	.07	178	7.96	139	.06	1	.14	-170
200	.07	-177	8.05	125	.05	5	.17	-168
250	.07	-163	8.13	110	.06	2	.22	-171

Amplifonix

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RF AMPLIFIER MODEL CZ8210

Available as: CZ8210, 3 Pin TO-39 (T10)
TN8210-3, 4 Pin Surface Mount (SM3)
FP8210-4, 4 Pin Flatpack (FP4)
BX8210, Connectorized Housing (H1)
PN8210, Reduced Size Surface Mount (SM11)

Pg. 9-1
Pg. 9-1
Pg. 9-3
Pg. 9-6
Pg. 9-6

Features

- Low Cost; Medium Gain: 10 dB Typical
- Noise Figure: <6 dB Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 600 MHz	KHz - 600 MHz
Gain (dB)	10	9.0 Min.
Power @ 1 dB Comp. (dBm)	-3.5	-6.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.75:1	2.5:1 Max.
VSWR Out	<1.75:1	2.5:1 Max.
Noise figure (dB)	<6.0	7.5 Max.
Power Vdc	+1.8	+1.8
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

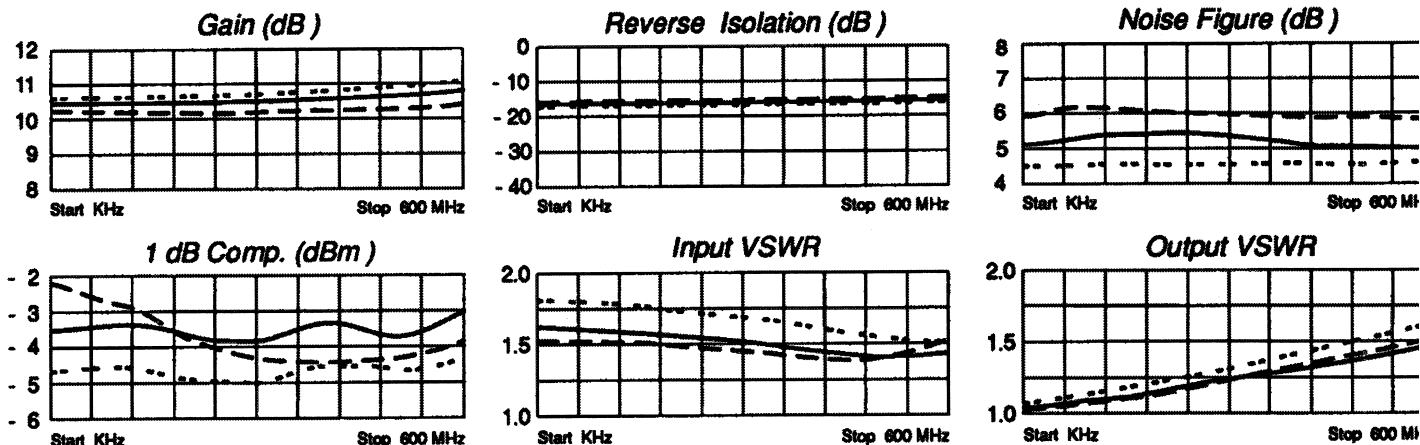
Second Order Harmonic Intercept Point +14 (Typ)
Second Order Two Tone Intercept Point + 8 (Typ)
Third Order Two Tone Intercept Point + 7 (Typ)

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C
Storage Temperature - 62 °C to + 125 °C
Case Temperature + 125 °C
DC Current 25 mA
Continuous RF Input Power + 6 dBm
Short Term RF Input Power 25 Milliwatts
(1 Minute Max)
Maximum Peak Power 0.25 Watts
(3 µsec Max)

* Decoupling Impedance is 1 Kohm

Typical Performance Data

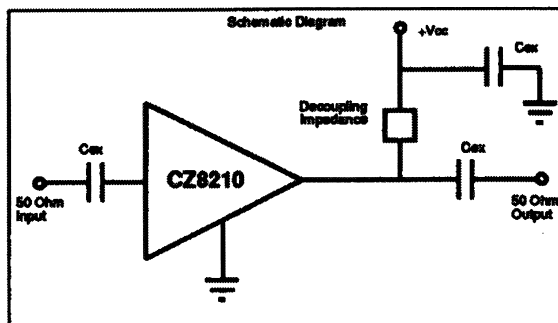


Legend ——— + 25 °C - - - - + 125 °C - 55 °C

The CZ82X0 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ82X0 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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07/28/83

RF AMPLIFIER MODEL CZ8230

Available as: CZ8230, 3 Pin TO-39 (T10)

Pg. 9-10

TN8230-3, 4 Pin Surface Mount (SM3)

Pg. 9-8

FP8230-4, 4 Pin Flatpack (FP4)

Pg. 9-3

BX8230, Connectorized Housing (H1)

Pg. 9-6

PN8230, Reduced Size Surface Mount (SM11)

Pg. 9-8

Features

- Low Cost; Medium Gain: 10 dB Typical
- High Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 600 MHz	KHz - 600 MHz
Gain (dB)	10	9.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+13.0 Min.
Reverse Isolation (dB)	- 14.5	- 32 Max.
VSWR In	<2.5:1	3.0:1 Max.
Out	<2.0:1	2.5:1 Max.
Noise figure (dB)	<7.0	8.0 Max.
Power Vdc	+4.5	+4.5
mA	60	66 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C.

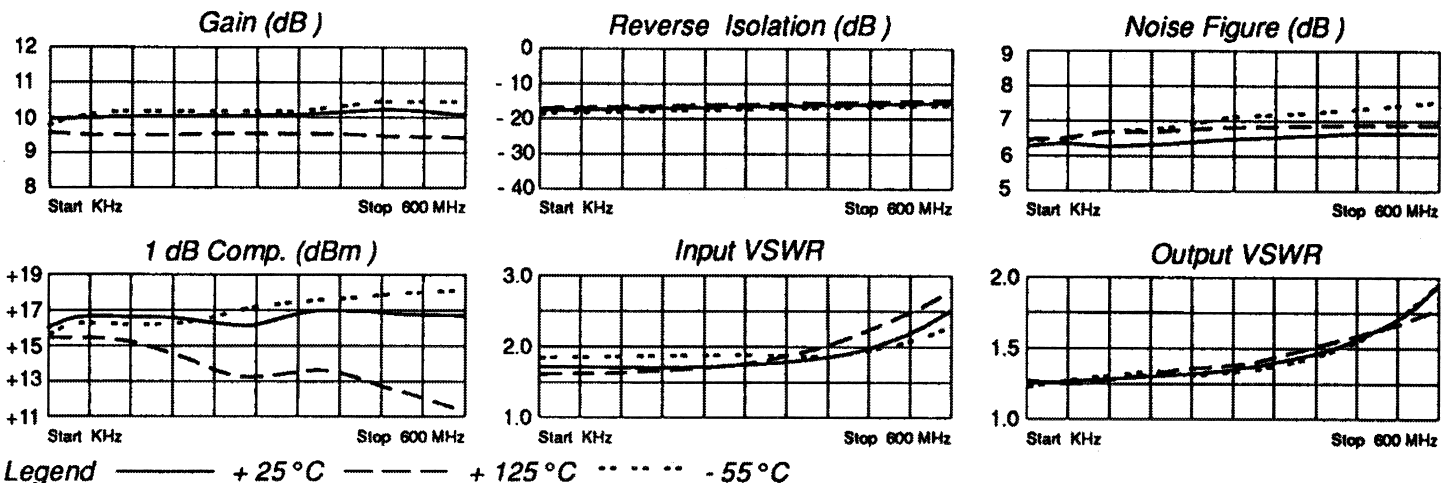
Second Order Harmonic Intercept Point +38 (Typ.)
Second Order Two Tone Intercept Point +32 (Typ.)
Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C
Storage Temperature - 62 °C to + 125 °C
Case Temperature + 125 °C
DC Current 100 mA
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
(3 µsec Max.)

* Decoupling Impedance is 330 Ohms

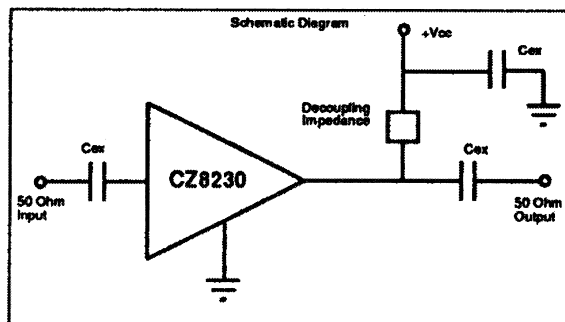
Typical Performance Data



The CZ82X0 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ82X0 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



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10/12/89
Rev A. 04/14/97

RF AMPLIFIER MODEL CZ8310

Available as: CZ8310, 3 Pin TO-39 (T10) Pg. 9-1
 TN8310-3, 4 Pin Surface Mount (SM3) Pg. 9-8
 FP8310-4, 4 Pin Flatpack (FP4) Pg. 9-3
 BX8310, Connectorized Housing (H1) Pg. 9-6
 PN8310, Reduced Size Surface Mount (SM11) Pg. 9-8

Features

- Low Cost; Medium Gain: 8 dB Typical
- Noise Figure: < 7 dB Typical
- Operating Temp. - 55 °C to + 125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 125 °C
Frequency	KHz - 1000 MHz	KHz -1000 MHz
Gain (dB)	8	7.0 Min.
Power @ 1 dB Comp. (dBm)	-1.5	-4.0 Min.
Reverse Isolation (dB)	- 13	- 12.0 Max.
VSWR In	<2.5:1	3.5:1 Max.
Out	<2.5:1	3.0:1 Max.
Noise figure (dB)	<7.0	8.0 Max.
Power Vdc	+1.6	+1.6
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

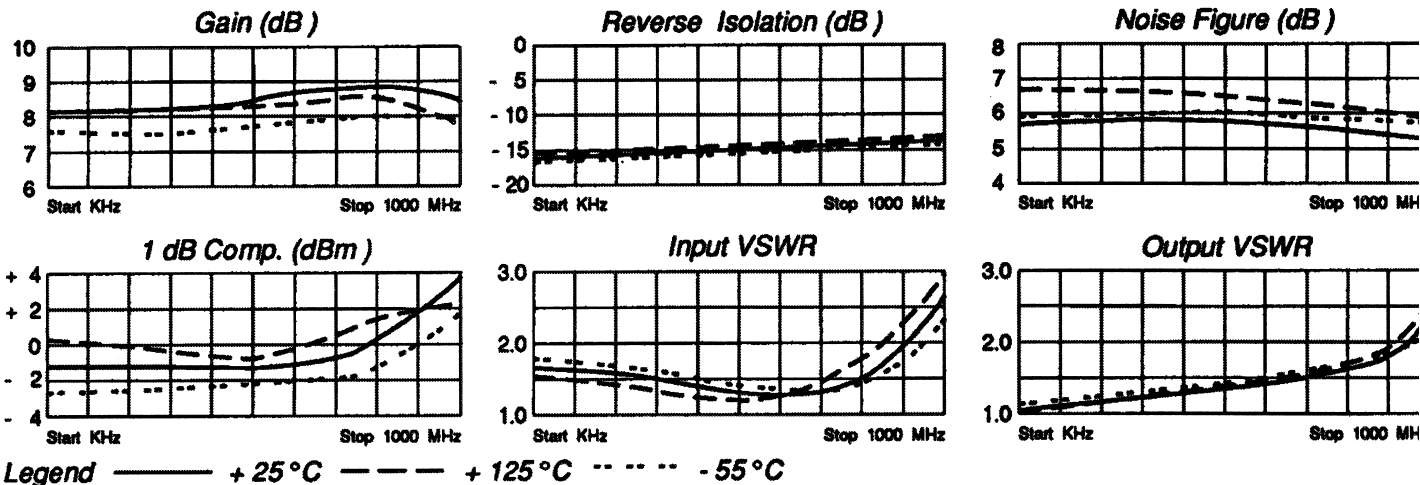
Second Order Harmonic Intercept Point +13 (Typ)
 Second Order Two Tone Intercept Point + 8 (Typ)
 Third Order Two Tone Intercept Point + 7 (Typ)

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 125 °C
 Storage Temperature - 62 °C to + 125 °C
 Case Temperature + 125 °C
 DC Current 25 mA
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 25 Milliwatt
 (1 Minute Max)
 Maximum Peak Power 0.25 Watt
 (3 µsec Max)

* Decoupling impedance is 1 Kohm

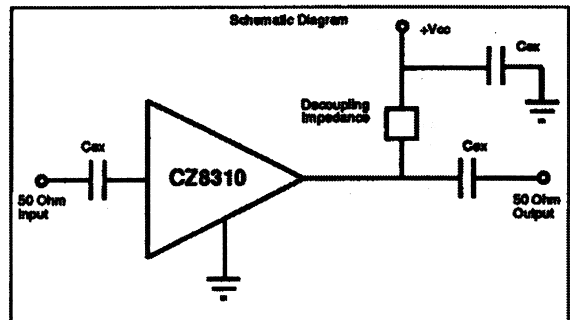
Typical Performance Data



The CZ83X0 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ83X0 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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08/03/93

RF AMPLIFIER MODEL CZ8330

Available as: CZ8330, 3 Pin TO-39 (T10) Pg. 9-10
 TN8330-3, 4 Pin Surface Mount (SM3) Pg. 9-8
 FP8330-4, 4 Pin Flatpack (FP4) Pg. 9-3
 BX8330, Connectorized Housing (H1) Pg. 9-6
 PN8330, Reduced Size Surface Mount (SM11) Pg. 9-8

Features

- Low Cost; Medium Gain: 6.2 dB Typical
- High Output Power: +14 dBm Typical
- Operating Temp. -55 °C to +125 °C
- Environmental Screening available

Specifications*

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +125 °C
Frequency	KHz - 1000 MHz	KHz - 1000 MHz
Gain (dB)	6.2	5.0 Min.
Power @ 1 dB Comp. (dBm)	+14	+10.0 Min.
Reverse Isolation (dB)	-14	-12.0 Max.
VSWR In	<2.5:1	3.0:1 Max.
VSWR Out	<2.5:1	3.0:1 Max.
Noise figure (dB)	<9.5	11.0 Max.
Power Vdc mA	+4.5 60	+4.5 65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C.

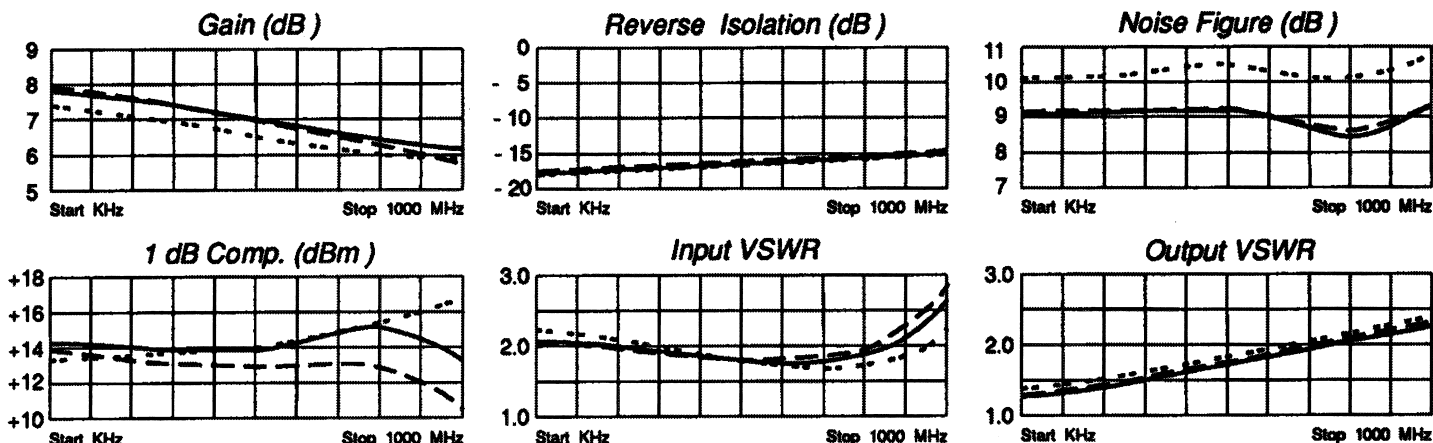
Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +31 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55 °C to +125 °C
 Storage Temperature -62 °C to +125 °C
 Case Temperature +125 °C
 DC Current 100 mA
 Continuous RF Input Power +18 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Decoupling impedance is 330 Ohms

Typical Performance Data

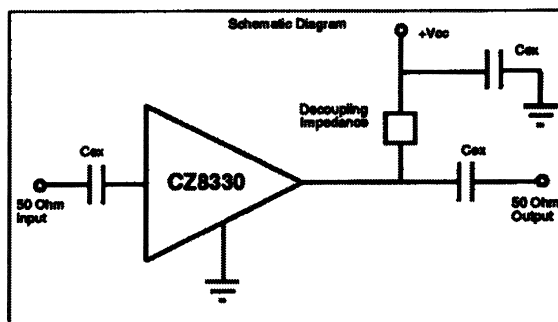


Legend ——— +25 °C - - - - +125 °C -55 °C

The CZ8330 Series Amplifiers are designed for application in 50 ohm systems. Three external capacitors and a decoupling impedance are required. The decoupling impedance must be large in comparison to the 50 ohm load to minimize gain reduction. Data sheet curves are based on the noted decoupling impedance. The external capacitors determine the low frequency response of the Amplifier.

The CZ8330 Series Amplifiers can be cascaded in series of two or more units without oscillation problems.

Application Information



Amplifonix

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08/13/93

RF AMPLIFIER

MODEL *TM9101*

Available as: TM9101, 4 Pin TO-8 (T4)
 TN9101, 4 Pin Surface Mount (SM3)
 FP9101, 4 Pin Flatpack (FP4)
 BX9101, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.4 dB Typical
- Medium Gain: 15 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +20 (Typ.)
 Second Order Two Tone Intercept Point +15 (Typ.)
 Third Order Two Tone Intercept Point +12 (Typ.)

Specifications

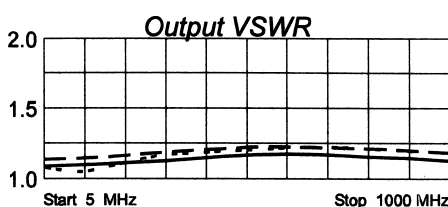
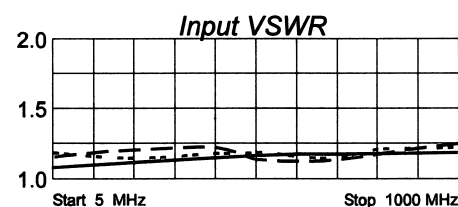
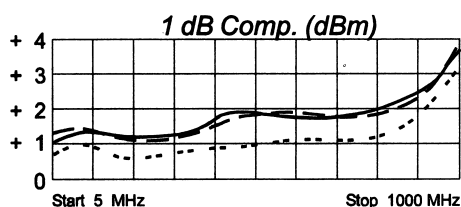
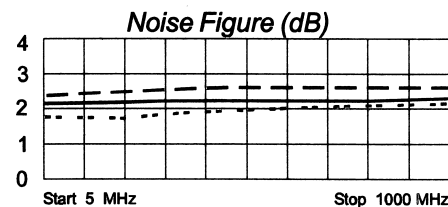
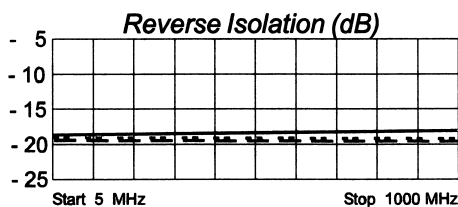
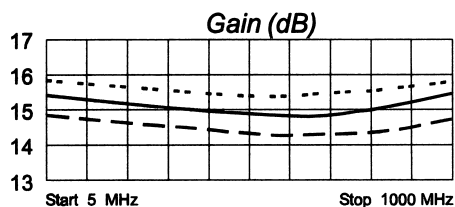
CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+1	-2.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.4	4.0 Max.
Power Vdc	+15	+15
mA	9	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.03	-11	5.89	-178	.11	3	.03	-23
100	.04	21	5.82	165	.11	-2	.04	12
200	.05	22	5.76	150	.11	-6	.04	7
400	.07	14	5.61	121	.11	-12	.07	-19
600	.08	-4	5.50	92	.11	-19	.08	-55
800	.08	-37	5.60	63	.11	-27	.07	-94
1000	.11	-97	5.94	30	.12	-36	.05	-131

Amplifonix

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RF AMPLIFIER

MODEL *TM9102*

Available as: TM9102, 4 Pin TO-8 (T4)
 TN9102, 4 Pin Surface Mount (SM3)
 FP9102, 4 Pin Flatpack (FP4)
 BX9102, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Typical
- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	15	13.5 Min.
Power @ 1 dB Comp. (dBm)	+10	+7.5 Min.
Reverse Isolation (dB)	- 17.5	- 16.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.0	4.5 Max.
Power Vdc mA	+15 23	+15 25 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

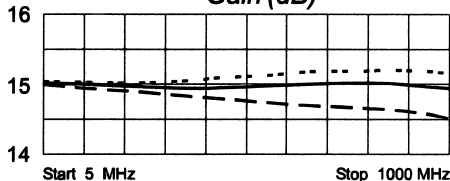
Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

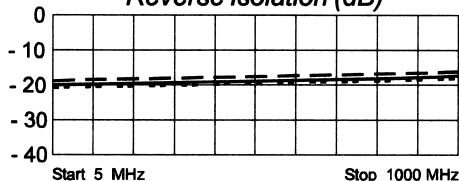
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

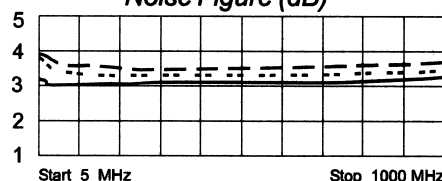
Gain (dB)



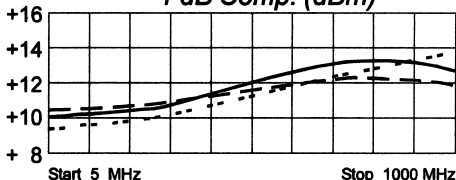
Reverse Isolation (dB)



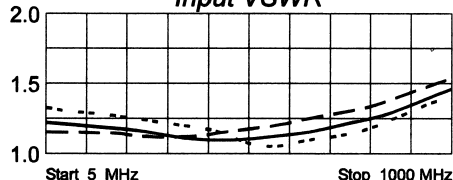
Noise Figure (dB)



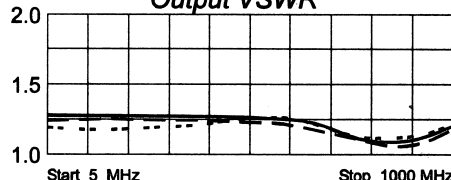
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.12	-169	5.58	-178	.10	4	.14	-171
50	.11	179	5.58	172	.10	0	.14	169
100	.11	173	5.55	164	.11	- 2	.14	158
200	.10	168	5.52	147	.11	- 5	.14	138
400	.07	177	5.43	115	.11	-10	.14	103
600	.08	-163	5.39	83	.12	-18	.13	78
800	.10	-167	5.43	50	.13	-27	.09	78
1000	.08	-169	5.36	13	.14	-36	.17	108

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RF AMPLIFIER MODEL *TM9106*

Available as: TM9106, 4 Pin TO-8 (T4)
TN9106, 4 Pin Surface Mount (SM3)
FP9106, 4 Pin Flatpack (FP4)
BX9106, Connectorized Housing (H1)

Features

- High Output Power: +19 dBm Typical
- Medium Noise Figure: < 4.8 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	12	10.5 Min.
Power @ 1 dB Comp. (dBm)	+19	+16.0 Min.
Reverse Isolation (dB)	- 14.5	- 13.5 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.8	6.0 Max.
Power Vdc	+15	+15
mA	70	75 Max.

Note: Care should always be taken to effectively ground the case of each unit.

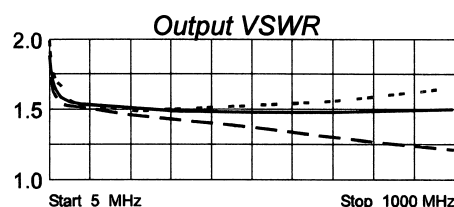
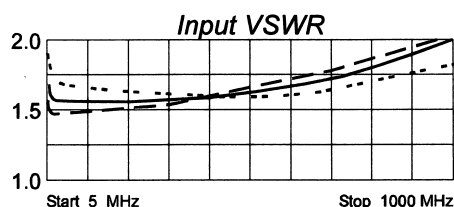
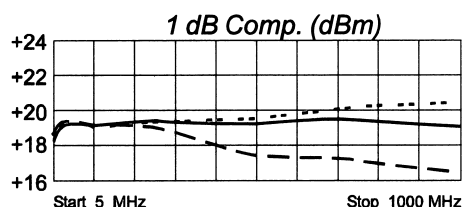
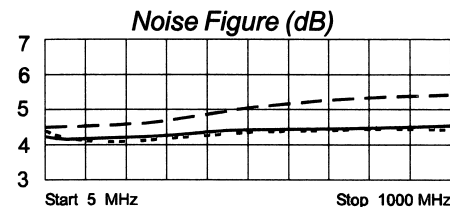
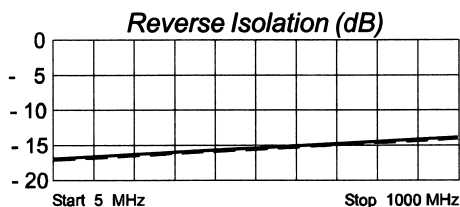
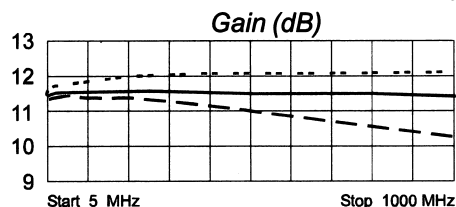
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +38 (Typ.)
Second Order Two Tone Intercept Point +32 (Typ.)
Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.27	-133	3.82	-164	.14	16	.30	-172
10	.23	-156	3.88	-173	.15	8	.24	-177
50	.22	-177	3.93	176	.15	2	.22	174
100	.23	179	3.93	168	.15	1	.21	166
200	.22	174	3.92	156	.15	1	.20	152
400	.23	167	3.91	131	.16	0	.20	126
600	.25	160	3.90	105	.17	-2	.19	101
800	.28	149	3.81	79	.18	-5	.19	143
1000	.32	133	3.69	52	.20	-9		83

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RF AMPLIFIER

MODEL *TM9107*

Available as: TM9107, 4 Pin TO-8 (T4)
 TN9107, 4 Pin Surface Mount (SM3)
 FP9107, 4 Pin Flatpack (FP4)
 BX9107, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Medium Output Power: +13 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1200 MHz	5 - 1000 MHz
Gain (dB)	13.5	11.5 Min.
Power @ 1 dB Comp. (dBm)	+13	+10.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.7:1	2.0:1 Max.
Noise figure (dB)	<3.9	5.0 Max.
Power Vdc	+ 5	+ 5
mA	33	36 Max.

Note: Care should always be taken to effectively ground the case of each unit.

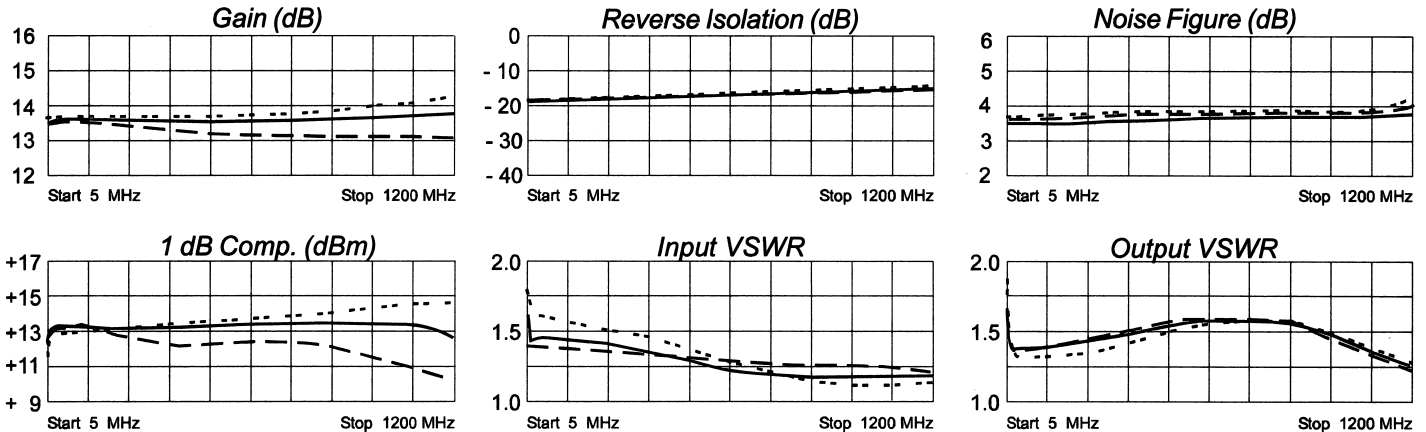
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +32 (Typ.)
 Second Order Two Tone Intercept Point +26 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.22	-139	4.82	-168	.12	13	.22	148
10	.18	-158	4.83	-175	.12	6	.18	158
50	.18	-179	4.90	174	.12	1	.16	159
100	.18	175	4.89	166	.12	-2	.16	146
200	.17	162	4.88	151	.13	-4	.17	118
400	.13	152	4.81	122	.13	-11	.21	73
600	.09	151	4.80	92	.14	-20	.23	34
800	.07	177	4.77	63	.15	-29	.22	-1
1000	.10	-173	4.81	32	.16	-41	.17	-36
1200	.11	179	4.87	-2	.17	-54	.08	-65

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RF AMPLIFIER

MODEL *TM9111*

Available as: TM9111, 4 Pin TO-8 (T4)
 TN9111, 4 Pin Surface Mount (SM3)
 FP9111, 4 Pin Flatpack (FP4)
 BX9111, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.4 dB Typical
- Low VSWR: <1.25:1 Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +20 (Typ.)
 Second Order Two Tone Intercept Point +15 (Typ.)
 Third Order Two Tone Intercept Point +12 (Typ.)

Specifications

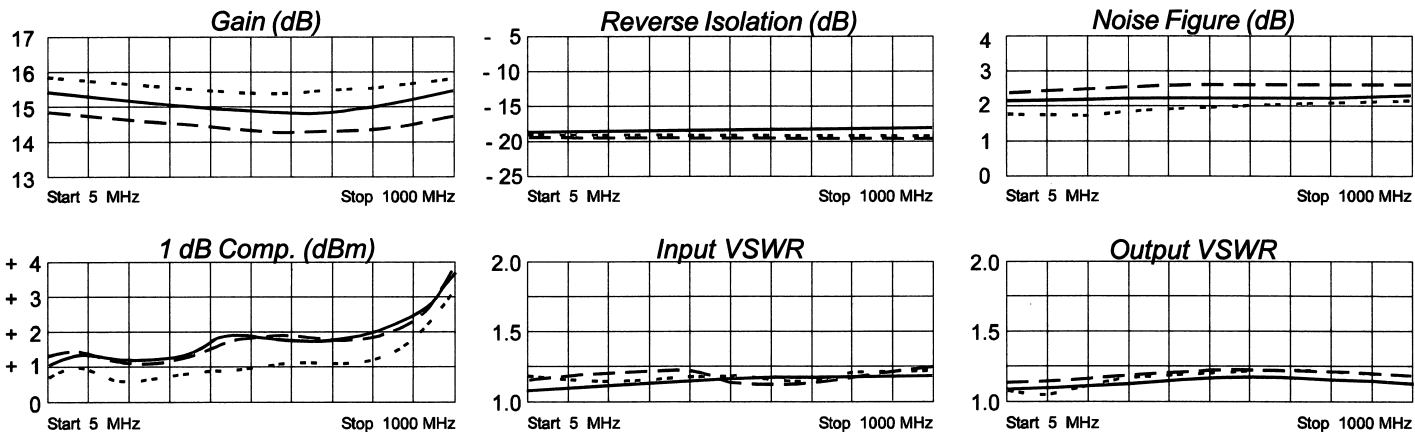
CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	15	14.0 Min.
Power @ 1 dB Comp. (dBm)	+1	-2.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.25:1	2.0:1 Max.
VSWR Out	<1.25:1	2.0:1 Max.
Noise figure (dB)	2.4	4.0 Max.
Power Vdc	+15	+15
mA	9	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.03	-11	5.89	-178	.11	3	.03	- 23
100	.04	21	5.82	165	.11	- 2	.04	12
200	.05	22	5.76	150	.11	- 6	.04	7
400	.07	14	5.61	121	.11	-12	.07	- 19
600	.08	- 4	5.50	92	.11	-19	.08	- 55
800	.08	-37	5.60	63	.11	-27	.07	- 94
1000	.11	-97	5.94	30	.12	-36	.05	-131

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RF AMPLIFIER

MODEL *TM9112*

Available as: TM9112, 4 Pin TO-8 (T4)
 TN9112, 4 Pin Surface Mount (SM3)
 FP9112, 4 Pin Flatpack (FP4)
 BX9112, Connectorized Housing (H1)

Features

- Typical Gain: 16 dB Gain Typical
- Low Noise Figure: <3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	16	14.5 Min.
Power @ 1 dB Comp. (dBm)	+11	+9 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.7:1	2.0:1 Max.
Noise figure (dB)	3	4 Max.
Power Vdc	+15	+15
mA	22	22 Max.

Note: Care should always be taken to effectively ground the case of each unit.

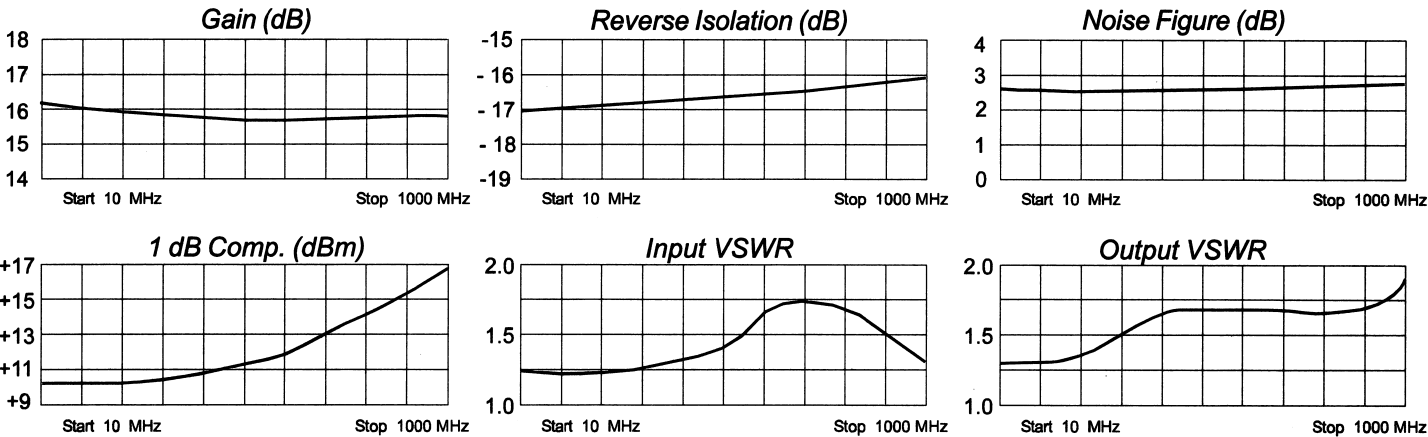
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +35 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C



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RF AMPLIFIER

MODEL *TM9114*

Available as: TM9114, 4 Pin TO-8 (T4)
 TN9114, 4 Pin Surface Mount (SM3)
 FP9114, 4 Pin Flatpack (FP4)
 BX9114, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Output Power: +6.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	20	18.0 Min.
Power @ 1 dB Comp. (dBm)	+7	+5.0 Min.
Reverse Isolation (dB)	-32	-30 Max.
VSWR In	<1.4:1	2.0:1 Max.
VSWR Out	<1.4:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+12	+12
mA	34	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

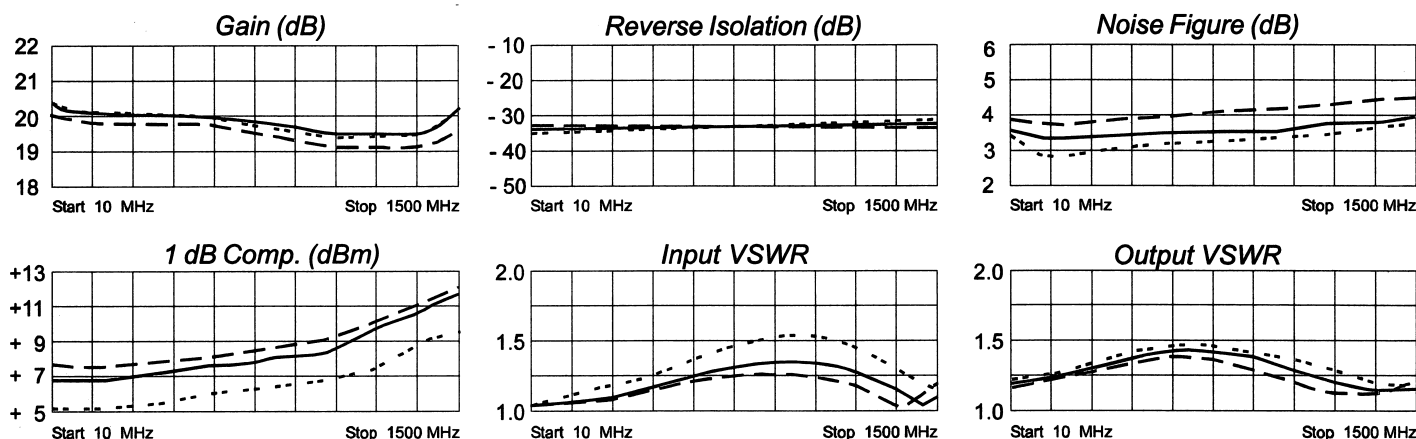
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +47 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 15 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	-38	10.48	-0	.02	0	.08	-170
50	.02	-50	10.26	-9	.02	-5	.08	-172
100	.02	-73	10.18	-18	.02	-7	.09	-171
200	.03	-118	10.12	-36	.02	-0	.10	-171
400	.07	-170	10.04	-72	.02	-4	.15	176
600	.12	150	10.10	-108	.02	-14	.18	151
800	.17	113	10.10	-145	.02	-14	.19	122
1000	.18	81	9.95	178	.02	-20	.16	88
1200	.14	52	9.75	141	.03	-37	.12	47
1400	.04	28	9.91	105	.03	-47	.08	-14
1500	.04	167	10.20	84	.02	-52	.08	-56

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RF AMPLIFIER

MODEL *TM9115*

Available as: TM9115, 4 Pin TO-8 (T4)
 TN9115, 4 Pin Surface Mount (SM3)
 FP9115, 4 Pin Flatpack (FP4)
 BX9115, Connectorized Housing (H1)

Features

- Medium Gain: 14.5 dB Typical
- Medium Output Power: +9.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	14.5	13.0 Min.
Power @ 1 dB Comp. (dBm)	+ 9.5	+ 8.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	< 4	5.5 Max.
Power Vdc mA	+15 24	+15 27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

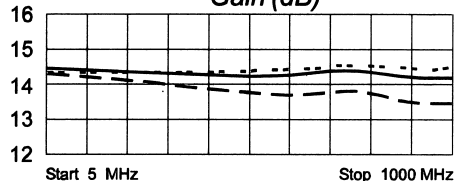
Second Order Harmonic Intercept Point +38 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

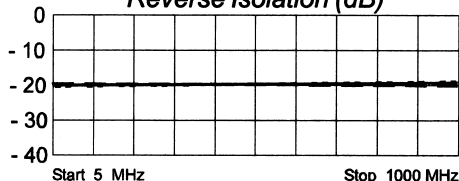
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

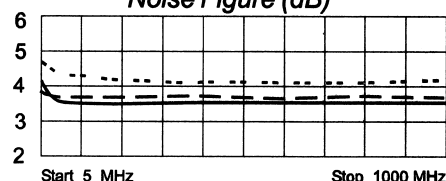
Gain (dB)



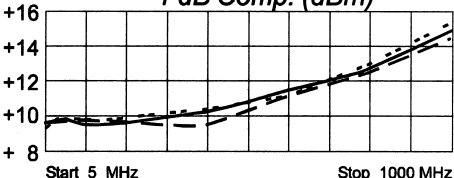
Reverse Isolation (dB)



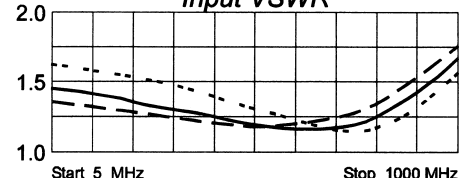
Noise Figure (dB)



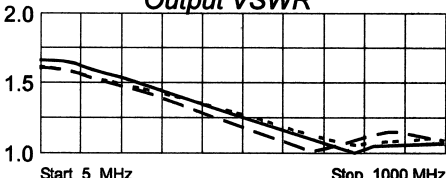
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.18	-172	5.29	-177	.10	4	.24	-172
10	.18	-177	5.29	-180	.10	2	.24	-177
50	.17	174	5.28	172	.10	-1	.23	174
100	.17	168	5.27	163	.10	-2	.23	166
200	.16	156	5.22	146	.10	-3	.21	152
400	.11	138	5.16	112	.10	-8	.15	126
600	.07	153	5.16	79	.11	-15	.08	101
800	.11	178	5.16	42	.12	-24	.01	143
1000	.26	160	5.09	3	.13	-36	.04	83

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RF AMPLIFIER

MODEL *TM9117*

Available as: TM9117, 4 Pin TO-8 (T4)
 TN9117, 4 Pin Surface Mount (SM3)
 FP9117, 4 Pin Flatpack (FP4)
 BX9117, Connectorized Housing (H1)

Features

- Medium Gain: 12 dB Typical
- Medium Output Power: +15.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	12	10.0 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+14.5 Min.
Reverse Isolation (dB)	- 14.5	- 13.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4	6.0 Max.
Power Vdc mA	+15 46	+15 47 Max.

Note: Care should always be taken to effectively ground the case of each unit.

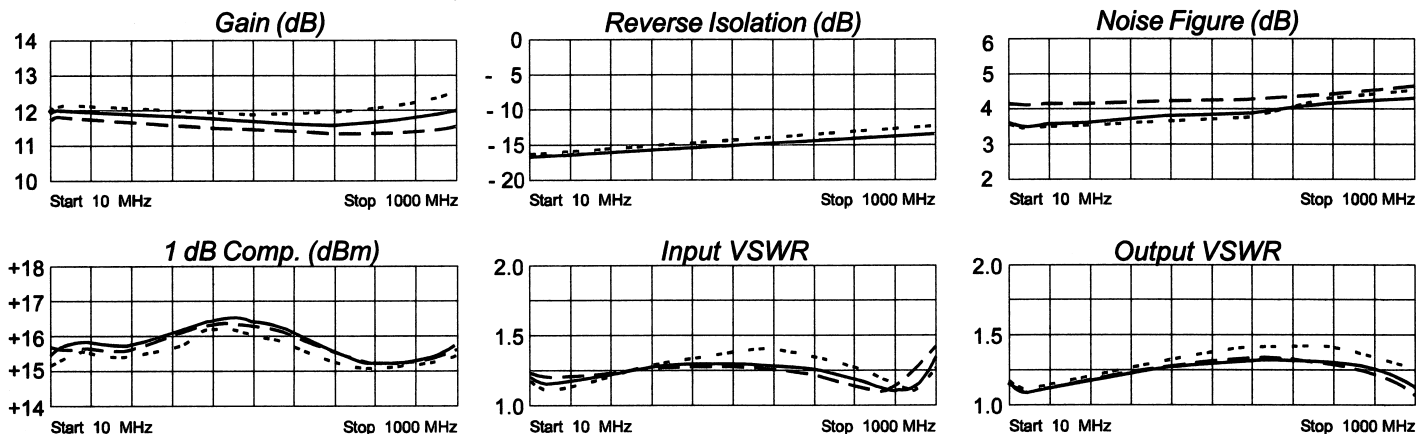
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.09	-23	3.94	-177	.15	4	.06	59
50	.07	3	3.97	173	.15	-1	.04	-13
100	.08	12	3.96	165	.15	-3	.05	-45
200	.10	22	3.95	149	.15	-7	.08	-78
400	.14	17	3.90	118	.15	-14	.13	-121
600	.14	-2	3.87	88	.17	-23	.17	-153
800	.09	-45	3.89	56	.18	-34	.15	170
1000	.16	169	4.01	18	.20	-53	.05	97

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RF AMPLIFIER

MODEL *TM9118*

Available as: TM9118, 4 Pin TO-8 (T4)
 TN9118, 4 Pin Surface Mount (SM3)
 FP9118, 4 Pin Flatpack (FP4)
 BX9118, Connectorized Housing (H1)

Features

- Medium Gain: 14.7 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 800 MHz	10 - 800 MHz
Gain (dB)	14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)	+16	+15.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	5.5 Max.
Power Vdc	+15	+15
mA	45	47 Max.

Note: Care should always be taken to effectively ground the case of each unit.

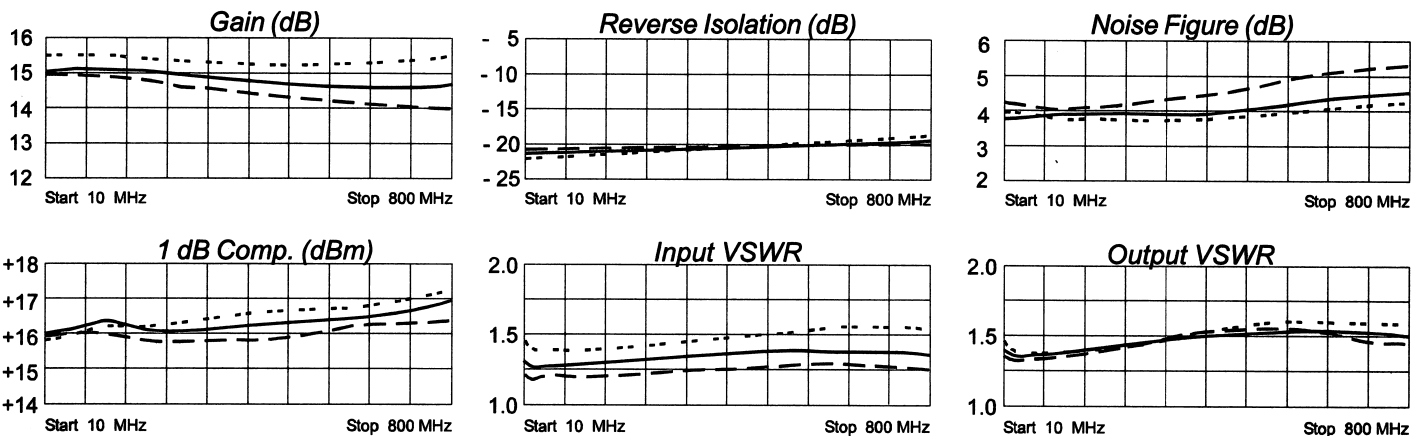
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.17	-155	6.02	-175	.08	6	.17	160
50	.16	176	6.06	173	.09	2	.15	158
100	.16	165	6.03	164	.09	1	.15	143
200	.17	148	5.88	147	.09	- 1	.16	114
400	.17	118	5.51	116	.10	- 2	.19	67
600	.17	89	5.30	88	.11	- 8	.20	31
800	.17	57	5.34	58	.12	-15	.19	- 2
1000	.13	19	5.53	25	.13	-23	.15	- 21

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3/18/03

RF AMPLIFIER

MODEL *TM9119*

Available as: TM9119, 4 Pin TO-8 (T4)
 TN9119, 4 Pin Surface Mount (SM3)
 FP9119, 4 Pin Flatpack (FP4)
 BX9119, Connectorized Housing (H1)

Features

- Medium Gain: 9 dB Gain Typical
- High Output Power: +21 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	9	7.0 Min.
Power @ 1 dB Comp. (dBm)	+21	+19.0 Min.
Reverse Isolation (dB)	- 13	- 12 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	8.5	11.0 Max.
Power Vdc	+15	+15
mA	100	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

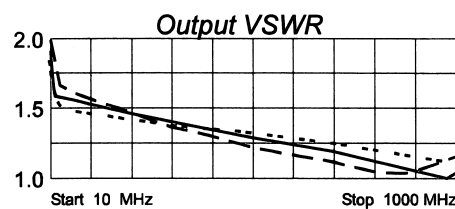
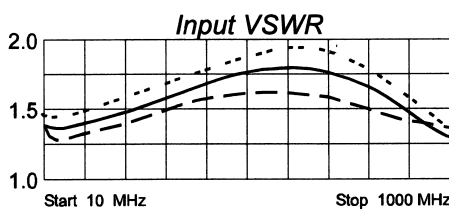
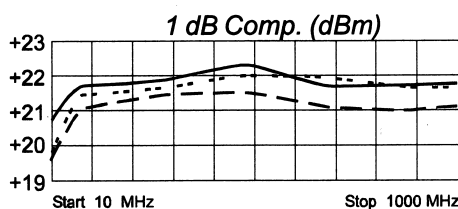
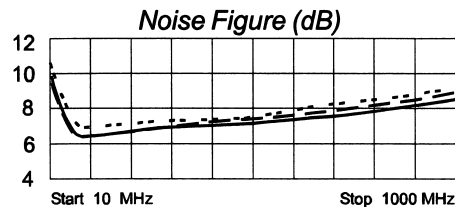
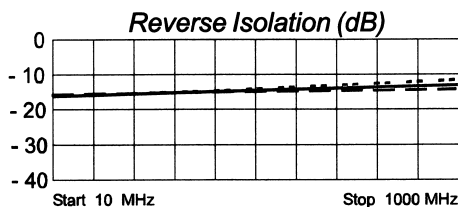
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +45 (Typ.)
 Second Order Two Tone Intercept Point +40 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.16	-131	2.82	-170	.15	13	.27	154
50	.15	174	2.83	175	.17	2	.22	167
100	.16	154	2.84	167	.17	0	.21	165
300	.22	101	2.84	136	.18	-5	.17	144
500	.27	67	2.83	106	.19	-11	.13	131
700	.27	41	2.83	75	.21	-20	.08	121
900	.19	26	2.85	44	.22	-31	.03	101
1000	.13	38	2.84	27	.22	-39	.02	-47

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RF AMPLIFIER

MODEL *TM9121*

Available as: TM9121, 4 Pin TO-8 (T4)
 TN9121, 4 Pin Surface Mount (SM3)
 FP9121, 4 Pin Flatpack (FP4)
 BX9121, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Gain Typical
- Medium Output Power: +13.5 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	15	13.5 Min.
Power @ 1 dB Comp. (dBm)	+13.5	+12.0 Min.
Reverse Isolation (dB)	-16	-15 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.0 Max.
Power Vdc mA	+15 34	+15 37 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

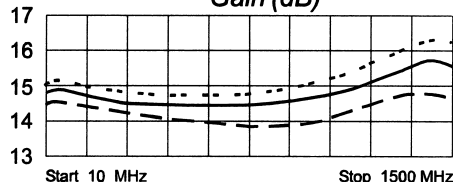
Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +34 (Typ.)
 Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

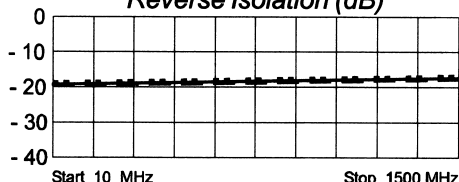
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

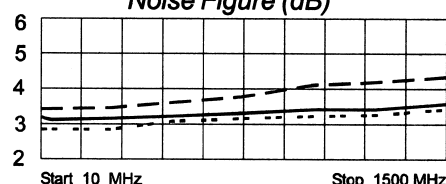
Gain (dB)



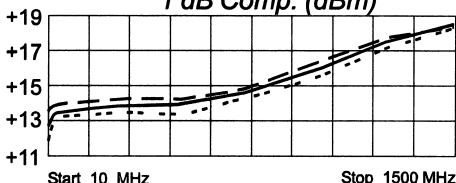
Reverse Isolation (dB)



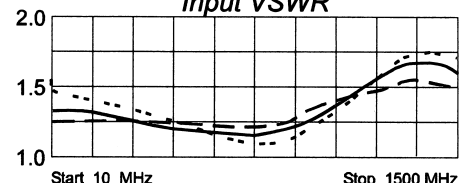
Noise Figure (dB)



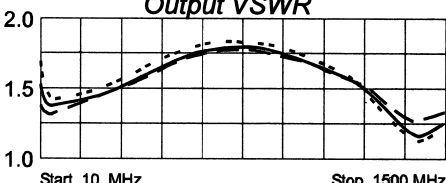
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.15	-139	5.42	-173	.11	9	.20	148
50	.14	-171	5.56	176	.11	1	.15	150
100	.15	-176	5.57	168	.11	-1	.15	138
250	.13	174	5.48	147	.12	-7	.19	99
500	.08	-178	5.32	115	.12	-16	.25	51
750	.06	-135	5.22	83	.13	-30	.29	9
1000	.13	-103	5.30	50	.13	-42	.25	-29
1250	.21	-112	5.62	12	.13	-52	.16	-82
1500	.19	-130	5.81	-40	.17	-66	.14	104

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RF AMPLIFIER

MODEL *TM9123*

Available as: TM9123, 4 Pin TO-8 (T4)
 TN9123, 4 Pin Surface Mount (SM3)
 FP9123, 4 Pin Flatpack (FP4)
 BX9123, Connectorized Housing (H1)

Features

- Medium Gain: 12 dB Typical
- Low Noise Figure: <4.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	12	10.0 Min.
Power @ 1 dB Comp. (dBm)	+4	+3.0 Min.
Reverse Isolation (dB)	- 16	- 14 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.0	4.5 Max.
Power Vdc	+15	+15
mA	14	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

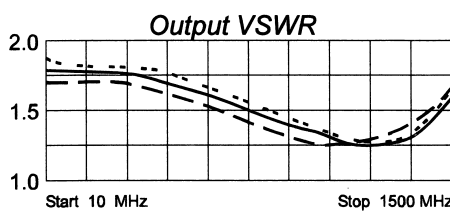
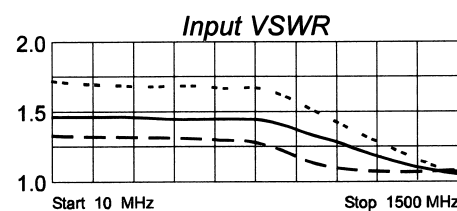
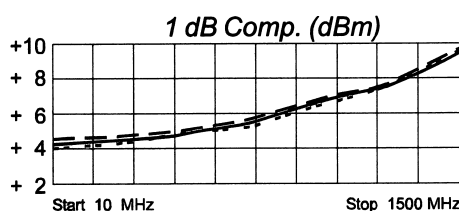
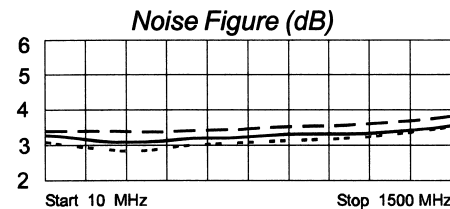
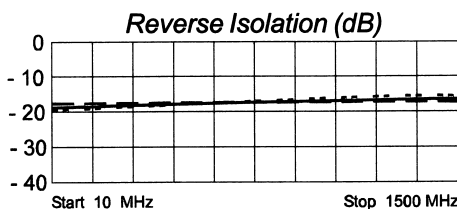
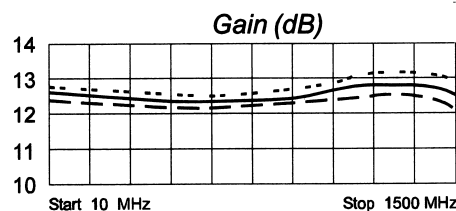
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +28 (Typ.)
 Second Order Two Tone Intercept Point +22 (Typ.)
 Third Order Two Tone Intercept Point +17 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.20	-175	4.00	-178	.13	4	.30	-175
50	.19	173	3.98	175	.13	- 0	.29	174
100	.19	166	3.95	169	.13	- 0	.29	167
250	.19	143	3.92	153	.13	- 1	.28	147
500	.18	113	3.82	129	.13	- 3	.25	115
800	.18	75	3.80	99	.15	- 9	.19	76
1000	.14	54	3.84	80	.15	-16	.15	46
1200	.11	34	4.06	59	.16	-21	.12	- 2
1400	.05	- 1	4.20	33	.16	-28	.12	- 77
1600	.06	-170	4.09	2	.16	-32	.20	-144

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RF AMPLIFIER

MODEL *TM9124*

Available as: TM9124, 4 Pin TO-8 (T4)
 TN9124, 4 Pin Surface Mount (SM3)
 FP9124, 4 Pin Flatpack (FP4)
 BX9124, Connectorized Housing (H1)

Features

- High Gain: 20 dB Typical
- Medium Output Power: +8 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	20	18.0 Min.
Power @ 1 dB Comp. (dBm)	+8	+6.0 Min.
Reverse Isolation (dB)	- 32	- 30 Max.
VSWR In	<1.4:1	2.0:1 Max.
Out	<1.4:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.5 Max.
Power Vdc	+15	+15
mA	34	38 Max.

Note: Care should always be taken to effectively ground the case of each unit.

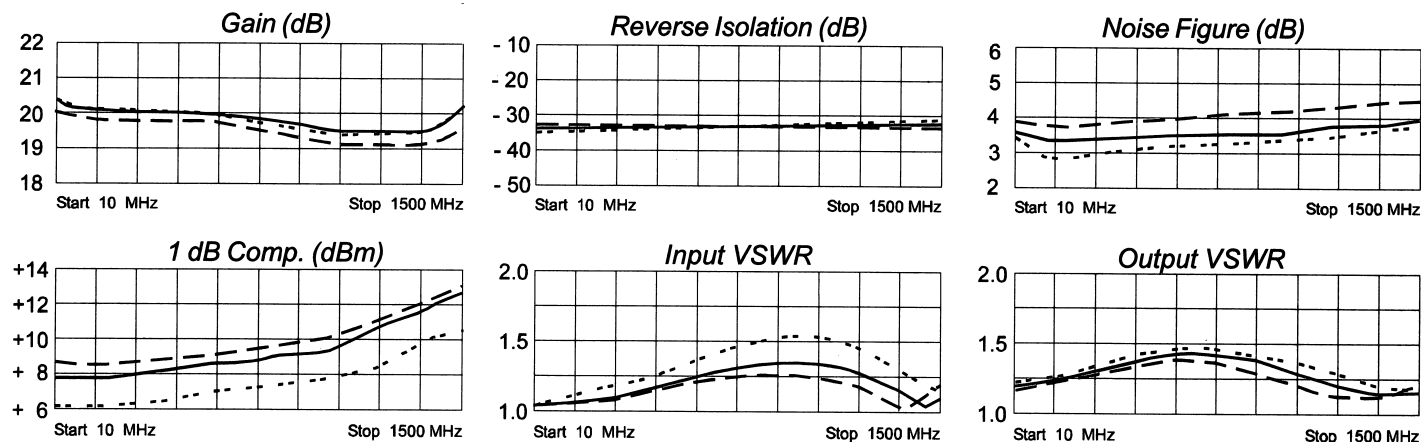
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +47 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	-38	10.48	-0	.02	0	.08	-170
50	.02	-50	10.26	-9	.02	-5	.08	-172
100	.02	-73	10.18	-18	.02	-7	.09	-171
200	.03	-118	10.12	-36	.02	-0	.10	-171
400	.07	-170	10.04	-72	.02	-4	.15	176
600	.12	150	10.10	-108	.02	-1	.18	151
800	.17	113	10.10	-145	.02	-14	.19	122
1000	.18	81	9.95	178	.02	-20	.16	88
1200	.14	52	9.75	141	.03	-37	.12	47
1400	.04	28	9.91	105	.03	-47	.08	-14
1500	.04	167	10.20	84	.02	-52	.08	-56

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RF AMPLIFIER

MODEL *TM9125*

Available as: TM9125, 4 Pin TO-8 (T4)
 TN9125, 4 Pin Surface Mount (SM3)
 FP9125, 4 Pin Flatpack (FP4)
 BX9125, Connectorized Housing (H1)

Features

- Medium Gain: 10.5 dB Typical
- Medium Output Power: +8 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	10.5	9.0 Min.
Power @ 1 dB Comp. (dBm)	+8	+7.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+15	+15
mA	24	27 Max.

Note: Care should always be taken to effectively ground the case of each unit.

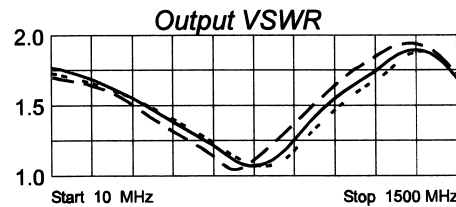
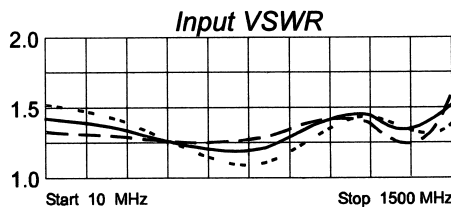
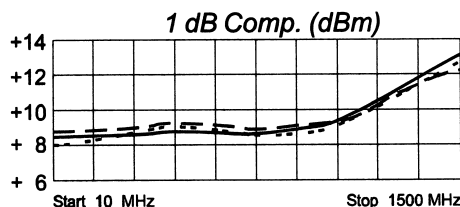
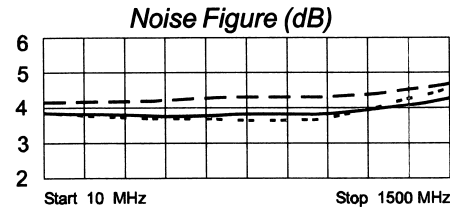
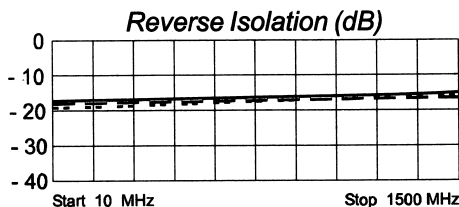
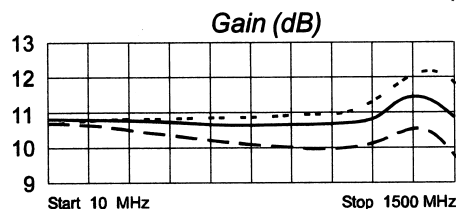
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +21 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.20	-176	3.61	-180	.13	2	.29	-177
100	.19	173	3.61	167	.13	- 2	.28	170
250	.17	163	3.58	147	.13	- 6	.25	152
500	.11	155	3.48	114	.14	-14	.16	131
750	.06	174	3.40	82	.14	-22	.06	146
1000	.09	-132	3.34	47	.15	-35	.14	-156
1250	.09	-173	3.49	11	.15	-50	.22	-179
1500	.24	9	3.60	- 48	.16	-76	.16	160

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RF AMPLIFIER

MODEL *TM9126*

Available as: TM9126, 4 Pin TO-8 (T4)
 TN9126, 4 Pin Surface Mount (SM3)
 FP9126, 4 Pin Flatpack (FP4)
 BX9126, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- Medium Output Power: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	20.5	18.5 Min.
Power @ 1 dB Comp. (dBm)	+15.0	+13.0 Min.
Reverse Isolation (dB)	- 30	- 27 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<5.0	6.0 Max.
Power Vdc	+15	+15
mA	64	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

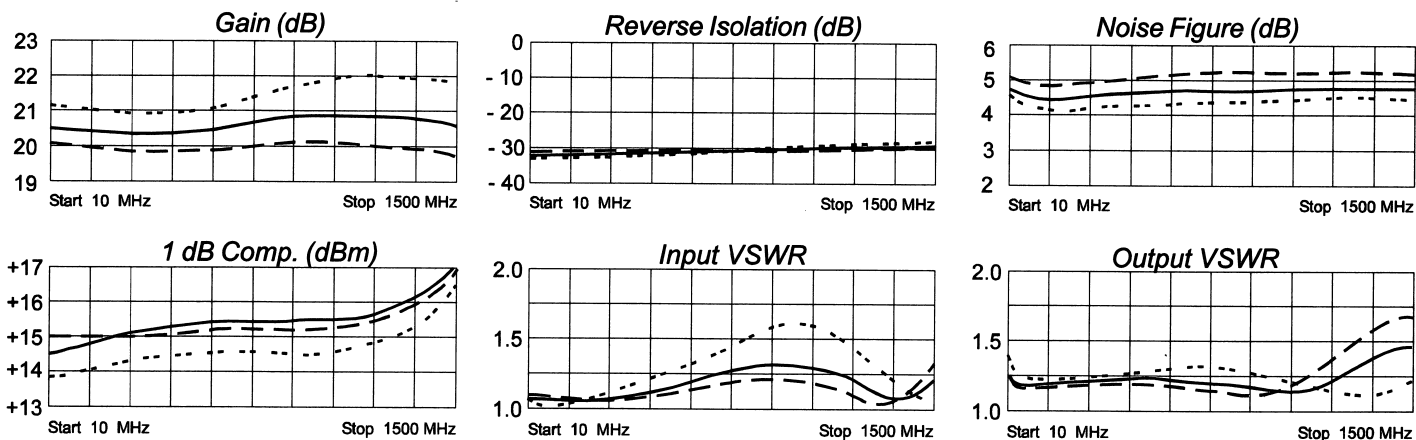
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	50	10.88	5	.03	8	.12	145
50	.01	- 33	10.84	- 11	.03	- 1	.08	166
100	.02	- 74	10.82	- 24	.03	- 8	.08	172
300	.05	-154	10.50	- 71	.03	- 19	.09	166
500	.10	156	10.61	-119	.03	- 35	.10	151
700	.17	110	10.95	-167	.03	- 54	.10	133
900	.20	65	11.55	143	.03	- 64	.07	117
1100	.19	20	11.83	89	.03	- 83	.05	146
1300	.11	- 30	11.55	32	.03	-100	.12	160
1500	.07	102	10.77	- 27	.03	-125	.21	128

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RF AMPLIFIER

MODEL *TM9127*

Available as: TM9127, 4 Pin TO-8 (T4)
 TN9127, 4 Pin Surface Mount (SM3)
 FP9127, 4 Pin Flatpack (FP4)
 BX9127, Connectorized Housing (H1)

Features

- Medium Gain: 9 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	9	8.0 Min.
Power @ 1 dB Comp. (dBm)	+16.0	+14.0 Min.
Reverse Isolation (dB)	- 11	- 10 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<6.0	8.0 Max.
Power Vdc	+15	+15
mA	52	57 Max.

Note: Care should always be taken to effectively ground the case of each unit.

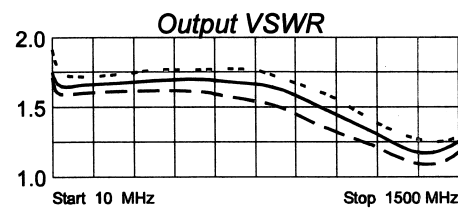
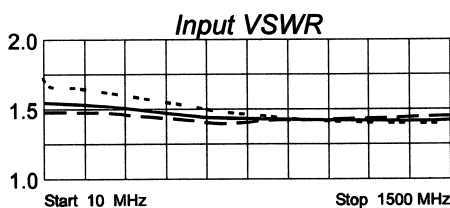
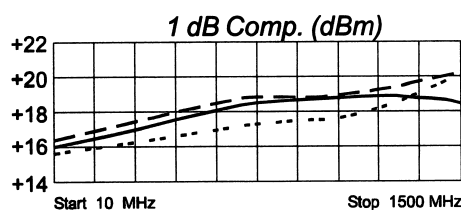
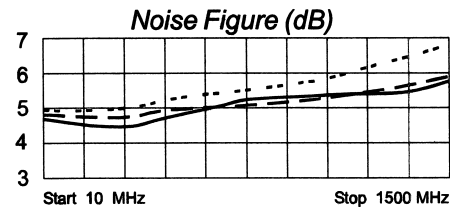
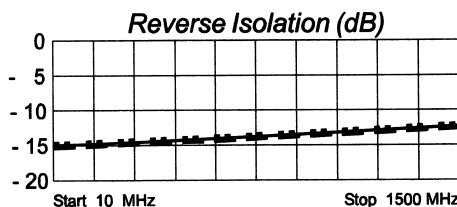
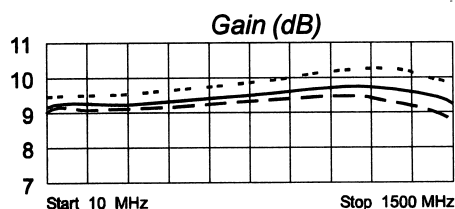
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +32 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.23	-156	2.83	-173	.17	9	.28	165
100	.22	178	2.89	168	.18	- 0	.24	162
250	.21	167	2.89	149	.18	- 3	.25	141
500	.19	156	2.92	117	.19	- 9	.25	107
750	.17	148	2.92	85	.21	-17	.24	77
1000	.17	135	2.96	52	.23	-26	.20	53
1250	.17	104	2.95	18	.25	-39	.13	41
1500	.17	48	2.81	- 19	.28	-53	.11	80
1750	.23	- 19	2.43	- 58	.30	-72	.21	77

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RF AMPLIFIER

MODEL *TM9128*

Available as: TM9128, 4 Pin TO-8 (T4)
 TN9128, 4 Pin Surface Mount (SM3)
 FP9128, 4 Pin Flatpack (FP4)
 BX9128, Connectorized Housing (H1)

Features

- Medium Output Power: +15.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	11.5	10 Min.
Power @ 1 dB Comp. (dBm)	+15	+13.5 Min.
Reverse Isolation (dB)	- 14.4	- 13.5 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+15	+15
mA	40	45 Max.

Note: Care should always be taken to effectively ground the case of each unit.

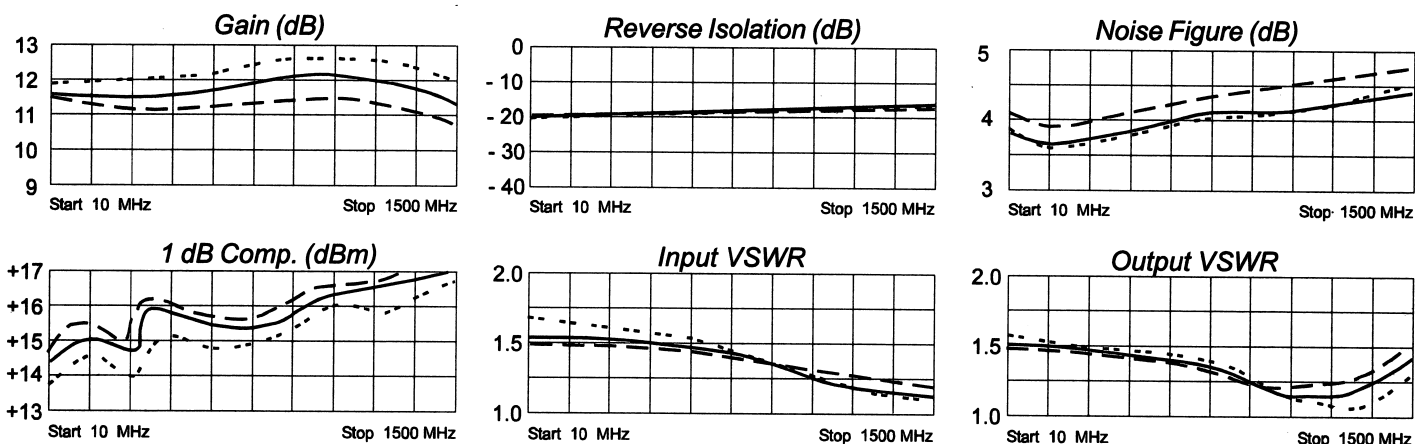
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-161	3.85	-174	.14	7	.24	167
50	.22	-177	3.89	176	.15	1	.21	168
100	.22	179	3.90	169	.15	- 0	.21	163
300	.21	167	3.88	146	.15	- 4	.20	132
500	.20	157	3.92	124	.16	- 8	.19	100
700	.17	149	3.98	100	.16	-14	.16	67
900	.14	140	4.02	76	.17	-19	.11	25
1100	.10	139	4.04	51	.17	-24	.07	- 42
1300	.09	131	3.96	23	.18	-31	.07	-143
1500	.05	128	3.71	- 5	.19	-37	.16	167

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RF AMPLIFIER

MODEL *TM9129*

Available as: TM9129, 4 Pin TO-8 (T4)
 TN9129, 4 Pin Surface Mount (SM3)
 FP9129, 4 Pin Flatpack (FP4)
 BX9129, Connectrized Housing (H1)
 PN9129, Reduced Size Surface Mount (SM11)

Features

- High Output Power: > +24 dBm Typical
- High Third Order Intercept: +34 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	8	6.0 Min.
Power @ 1 dB Comp. (dBm)	>+20.5	+19 Min.
Reverse Isolation (dB)	- 15	-13.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<8	9.5* Max.
Power Vdc	+15	+15
mA	95	100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

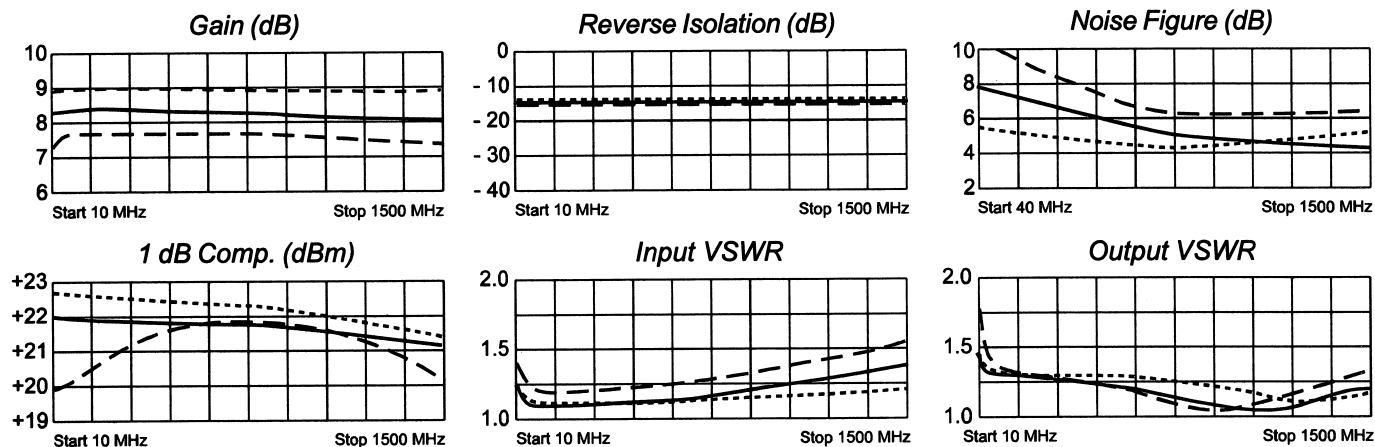
Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Noise Figure will be Greater Below 40 MHz

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---- S11 ----		---- S21 ----		---- S12 ----		---- S22 ----	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.11	- 81	2.58	-167	.165	10	.19	151
50	.03	- 98	2.64	-180	.168	1	.14	166
100	.02	-118	2.65	176	.169	0	.13	167
250	.02	-141	2.66	167	.171	- 7	.12	163
500	.02	-171	2.64	153	.173	- 15	.10	159
750	.03	177	2.59	139	.167	- 23	.09	152
1000	.04	177	2.54	125	.164	- 31	.08	139
1250	.06	163	2.50	112	.158	- 40	.05	120
1500	.06	161	2.42	99	.144	- 46	.02	25

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Rev.C 05/16/02

RF AMPLIFIER

MODEL TM9133

Available as: TM9133, 4 Pin TO-8 (T4)
 TN9133, 4 Pin Surface Mount (SM3)
 FP9133, 4 Pin Flatpack (FP4)
 BX9133, Connectorized Housing (H1)

Features

- Medium Gain: 9.5 dB Gain Typical
- Low Noise Figure: <4.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	9.5	8.0 Min.
Power @ 1 dB Comp. (dBm)	+3	+2.0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	5.5 Max.
Power Vdc	+15	+15
mA	14	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

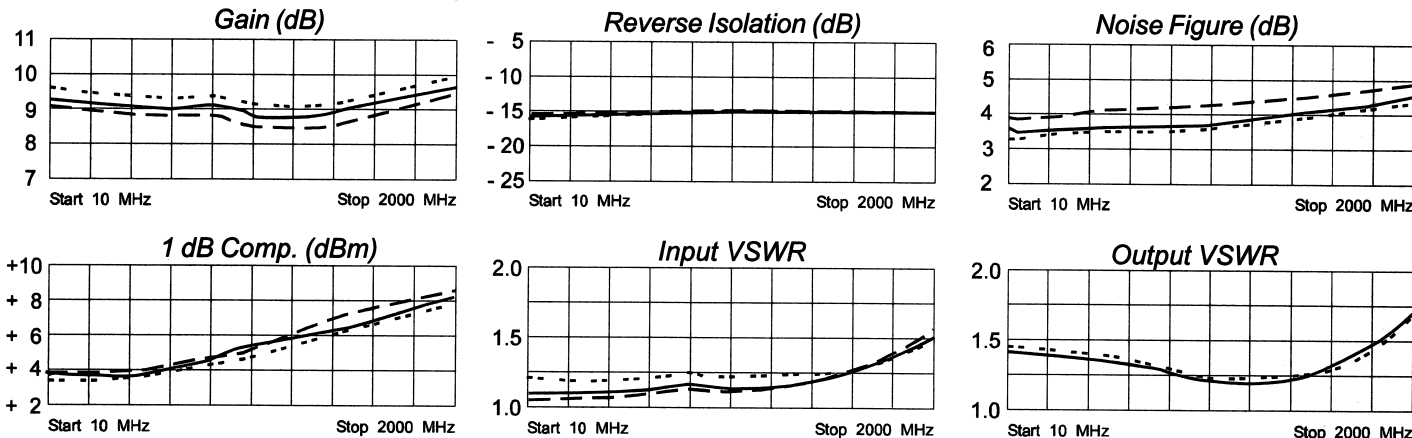
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +29 (Typ.)
 Second Order Two Tone Intercept Point +23 (Typ.)
 Third Order Two Tone Intercept Point +16 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.05	-169	2.94	-179	.16	2	.16	-175
50	.05	179	2.94	176	.16	1	.16	175
100	.05	178	2.93	171	.16	-1	.15	170
250	.05	160	2.90	158	.16	-3	.15	149
500	.05	150	2.86	137	.16	-6	.14	120
750	.07	141	2.86	116	.17	-10	.12	79
1000	.07	123	2.79	95	.17	-16	.09	44
1250	.08	134	2.83	76	.17	-22	.08	-6
1500	.11	134	2.95	57	.17	-28	.11	-53
1750	.14	138	3.16	36	.16	-33	.16	-89
2000	.19	153	3.42	15	.16	-35	.23	-119

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RF AMPLIFIER

MODEL **TM9134**

Available as: TM9134, 4 Pin TO-8 (T4)
 TN9134, 4 Pin Surface Mount (SM3)
 FP9134, 4 Pin Flatpack (FP4)
 BX9134, Connectorized Housing (H1)

Features

- High Gain: 16.5 dB Gain Typical
- Medium Output Power: +6 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	16.5	14.0 Min.
Power @ 1 dB Comp. (dBm)	+6	+3.0 Min.
Reverse Isolation (dB)	- 28	- 27 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+15	+15
mA	35	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

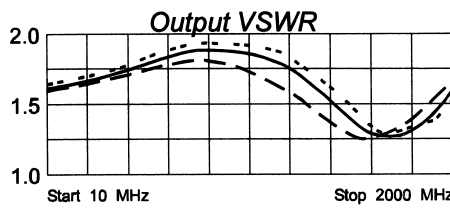
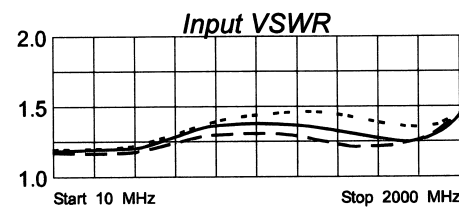
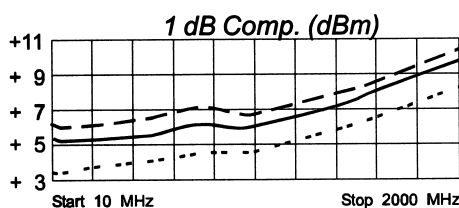
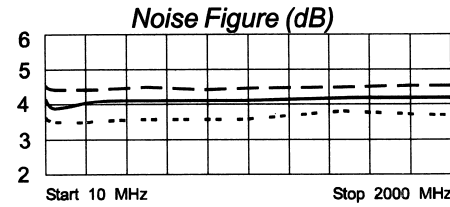
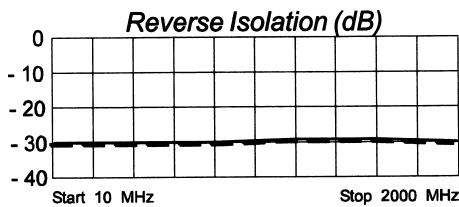
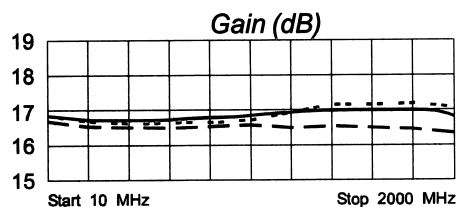
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +16 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.01	-70	6.38	0	.03	4	.19	-174
50	0.00	-30	6.28	-8	.03	3	.19	-180
100	0.00	126	6.24	-16	.03	1	.19	178
250	.02	100	6.22	-38	.03	-7	.20	172
500	.05	102	6.32	-77	.03	-10	.24	160
750	.08	93	6.43	-117	.03	-20	.26	141
1000	.10	83	6.49	-156	.03	-31	.27	116
1250	.11	79	6.60	165	.04	-39	.24	88
1500	.11	93	6.81	127	.03	-64	.15	56
1750	.17	111	7.35	87	.03	-68	.04	-13
2000	.32	123	8.70	45	.03	-68	.13	-145

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RF AMPLIFIER

MODEL *TM9135*

Available as: TM9135, 4 Pin TO-8 (T4)
 TN9135, 4 Pin Surface Mount (SM3)
 FP9135, 4 Pin Flatpack (FP4)
 BX9135, Connectorized Housing (H1)

Features

- Medium Gain: 10 dB Typical
- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	+9	+7.5 Min.
Reverse Isolation (dB)	- 16	- 13 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.0	6.5 Max.
Power Vdc	+15	+15
mA	25	29 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

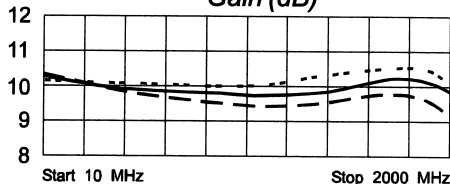
Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

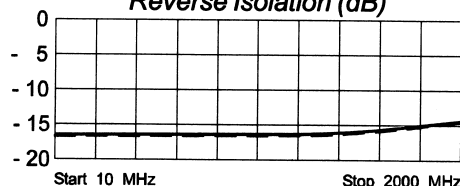
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

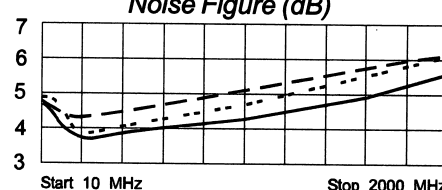
Gain (dB)



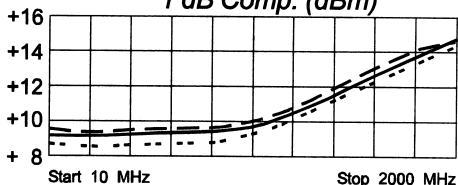
Reverse Isolation (dB)



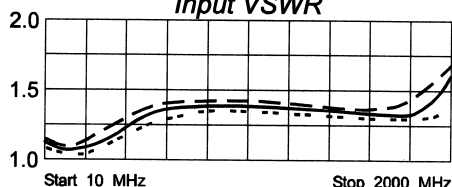
Noise Figure (dB)



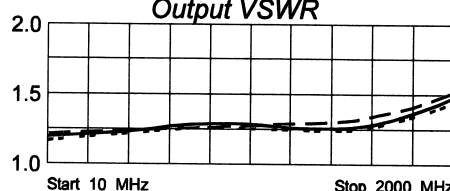
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	- 9	3.29	-180	.15	1	.07	-178
100	.07	- 30	3.25	168	.15	- 4	.08	153
200	.08	- 57	3.22	156	.15	- 7	.08	130
400	.10	- 89	3.13	133	.15	- 16	.10	88
600	.12	-134	3.06	112	.15	- 24	.12	53
800	.14	-160	3.01	90	.15	- 31	.13	27
1000	.16	173	2.97	69	.15	- 40	.13	- 2
1200	.16	144	3.02	47	.15	- 47	.13	- 33
1400	.16	109	3.10	24	.16	- 56	.12	- 71
1600	.16	65	3.17	- 1	.17	- 66	.13	-108
1800	.17	12	3.18	- 29	.18	- 77	.16	-151
2000	.23	- 36	3.01	- 61	.19	- 92	.19	170

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RF AMPLIFIER MODEL *TM9136*

Available as: TM9136, 4 Pin TO-8 (T4)
TN9136, 4 Pin Surface Mount (SM3)
FP9136, 4 Pin Flatpack (FP4)
BX9136, Connectorized Housing (H1)

Features

- High Gain: 17 dB Typical
- Medium Output Power: +12 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	17	15.0 Min.
Power @ 1 dB Comp. (dBm)	+12	+11.0 Min.
Reverse Isolation (dB)	- 26	- 25.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<5.5	7.5 Max.
Power Vdc	+15	+15
mA	63	68 Max.

Note: Care should always be taken to effectively ground the case of each unit.

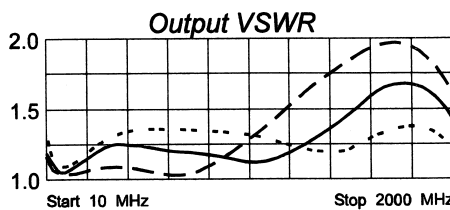
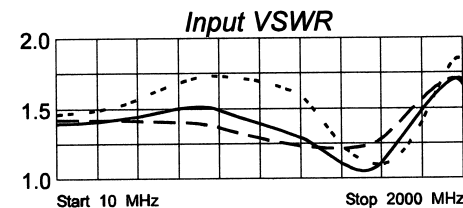
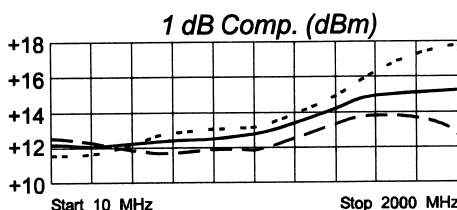
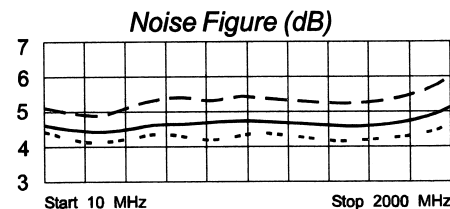
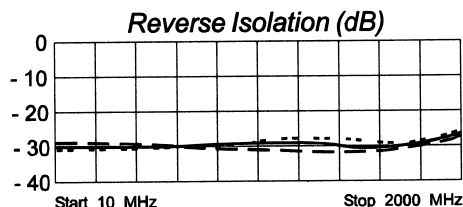
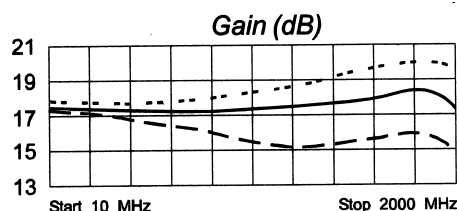
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +33 (Typ.)
Second Order Two Tone Intercept Point +28 (Typ.)
Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 10 dBm
Short Term RF Input Power 50 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.16	178	7.66	6	.03	9	.08	104
50	.16	179	7.63	- 8	.03	2	.01	151
100	.16	179	7.62	- 19	.03	- 5	.02	-123
250	.17	175	7.51	- 48	.03	- 6	.07	-141
500	.19	159	7.31	- 95	.03	-11	.10	176
750	.20	138	7.16	-141	.03	-17	.08	122
1000	.18	104	7.24	173	.03	-26	.05	21
1250	.12	66	7.35	126	.03	-44	.11	- 72
1500	.02	22	7.51	76	.03	-50	.20	-126
1750	.12	120	7.85	21	.04	-55	.24	-180
2000	.26	42	7.22	- 54	.05	-81	.14	103

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RF AMPLIFIER

MODEL *TM9137*

Available as: TM9137, 4 Pin TO-8 (T4)
 TN9137, 4 Pin Surface Mount (SM3)
 FP9137, 4 Pin Flatpack (FP4)
 BX9137, Connectorized Housing (H1)

Features

- Medium Output Power: +15.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	9.5	7.0 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+13.0 Min.
Reverse Isolation (dB)	- 9.5	- 8.5 Max.
VSWR In	1.75:1	2.2:1 Max.
Out	1.5:1	2.2:1 Max.
Noise figure (dB)	6.5	10.0 Max.
Power Vdc	+15	+15
mA	45	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

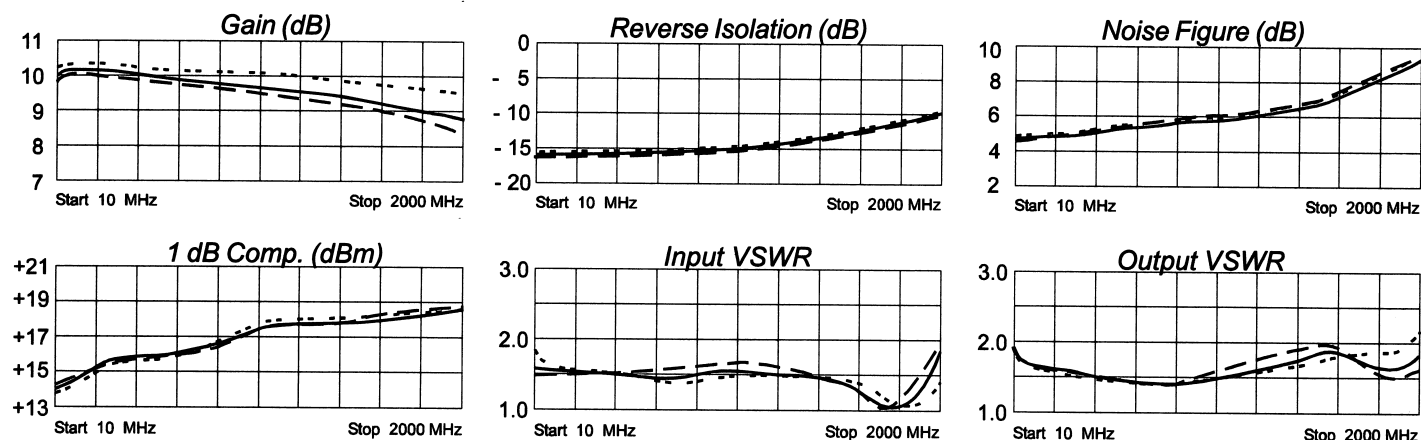
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-153	3.14	-172	.16	10	.28	163
100	.21	-178	3.21	169	.16	- 1	.24	160
200	.21	179	3.20	156	.16	- 4	.23	144
400	.20	177	3.18	132	.17	- 9	.22	110
600	.19	179	3.15	108	.17	- 15	.20	71
800	.19	-177	3.08	84	.18	- 22	.20	29
1000	.20	-176	3.05	61	.19	- 30	.22	- 14
1200	.21	-179	2.97	37	.21	- 38	.26	- 56
1400	.20	171	2.93	12	.23	- 49	.28	- 97
1600	.15	155	2.87	- 12	.25	- 62	.30	-140
1800	.05	94	2.88	- 39	.29	- 79	.29	164
2000	.21	- 38	2.96	- 70	.32	-106	.35	92

Amplifonix

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RF AMPLIFIER

MODEL *TM9138*

Available as: TM9138, 4 Pin TO-8 (T4)
 TN9138, 4 Pin Surface Mount (SM3)
 FP9138, 4 Pin Flatpack (FP4)
 BX9138, Connectorized Housing (H1)

Features

- Medium Output Power: +19 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Specifications

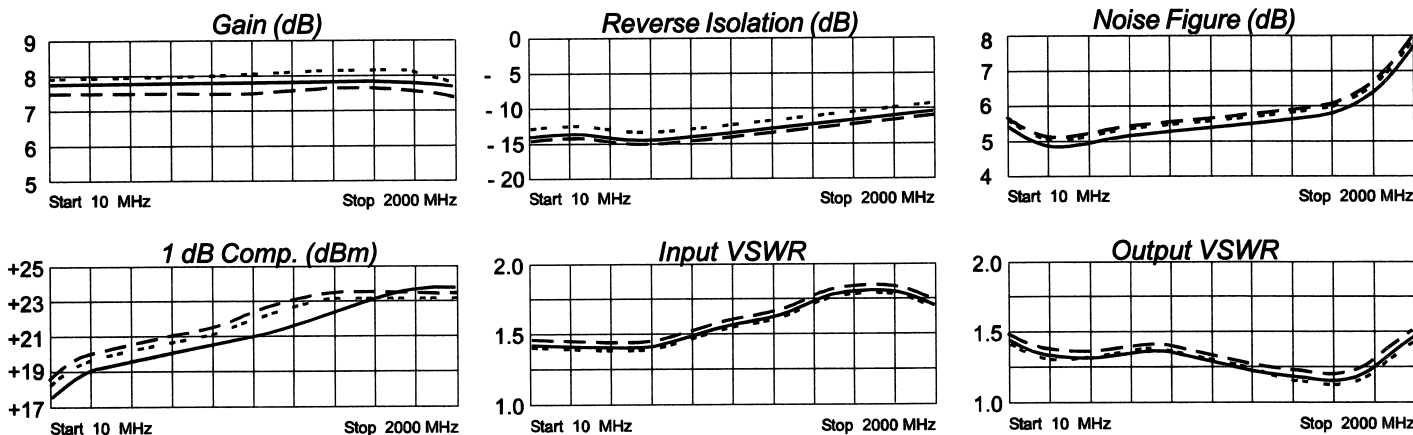
CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		10 - 2000 MHz	10 - 2000 MHz
Gain (dB)		7.5	6.0 Min.
Power @ 1 dB Comp. (dBm)		+19	+16.5 Min.
Reverse Isolation (dB)		- 9.75	- 9 Max.
VSWR	In Out	1.8:1 1.5:1	2.2:1 Max. 2.2:1 Max.
Noise figure (dB)		6.0	9.5 Max.
Power	Vdc mA	+15 65	+15 72 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C ---- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.17	-148	2.49	-172	.19	10	.22	157
100	.16	-176	2.56	171	.20	2	.18	158
200	.16	180	2.56	160	.20	1	.17	143
400	.17	176	2.55	139	.20	2	.17	111
600	.17	174	2.53	119	.21	1	.18	80
800	.18	172	2.49	100	.22	-1	.17	49
1000	.19	170	2.46	82	.24	-3	.15	15
1200	.21	165	2.45	64	.25	-5	.14	-23
1400	.23	156	2.48	46	.27	-9	.13	-71
1600	.24	144	2.56	28	.30	-12	.16	-121
1800	.24	127	2.67	7	.33	-17	.23	-165
2000	.23	102	2.69	-20	.36	-27	.30	151

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RF AMPLIFIER

MODEL *TM9139*

Available as: TM9139, 4 Pin TO-8 (T4)
TN9139, 4 Pin Surface Mount (SM3)
FP9139, 4 Pin Flatpack (FP4)
BX9139, Connectrized Housing (H1)
PN9139, Reduced Size Surface Mount (SM11)

Features

- High Output Power: > +24 dBm Typical
- High Third Order Intercept: +34 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	8	6.0 Min.
Power @ 1 dB Comp. (dBm)	>+24	+22 Min.
Reverse Isolation (dB)	- 15	-13.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<8	9.5 Max.
VSWR Vdc	+15	+15
mA	90	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

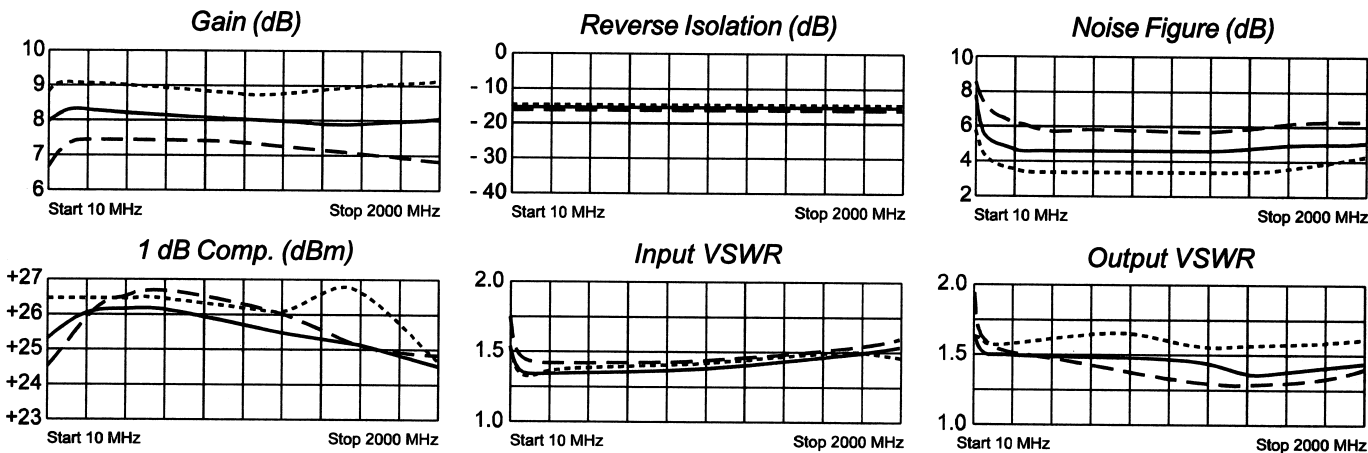
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +48 (Typ.)
Second Order Two Tone Intercept Point +42 (Typ.)
Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.11	- 80	2.56	-168	.167	9	.17	154
100	.02	- 88	2.61	176	.171	- 1	.13	168
200	.02	-117	2.62	170	.172	- 5	.12	165
400	.02	-149	2.61	159	.172	- 11	.11	159
600	.02	-159	2.61	148	.173	- 16	.10	152
800	.03	-175	2.58	137	.168	- 22	.09	142
1000	.04	176	2.57	126	.168	- 28	.07	127
1200	.04	160	2.55	115	.164	- 33	.06	111
1400	.04	162	2.49	106	.157	- 38	.03	52
1600	.10	156	2.58	96	.173	- 44	.01	95
1800	.10	137	2.56	84	.164	- 53	.04	- 28
2000	.11	132	2.59	72	.157	- 61	.09	- 53

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Rev. A 11/06/00

RF AMPLIFIER

MODEL *TM9143*

Available as: TM9143, 4 Pin TO-8 (T4)
 TN9143, 4 Pin Surface Mount (SM3)
 FP9143, 4 Pin Flatpack (FP4)
 BX9143, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.5 dB Typical
- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	10.5	9.0 Min.
Power @ 1 dB Comp. (dBm)	+10	+8.0 Min.
Reverse Isolation (dB)	- 11.5	- 11 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.5	4.5 Max.
Power Vdc	+15	+15
mA	25	28 Max.

Note: Care should always be taken to effectively ground the case of each unit.

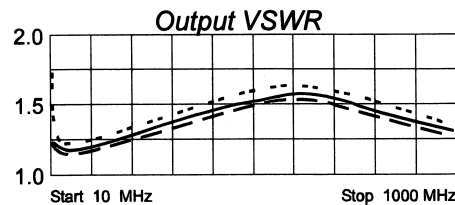
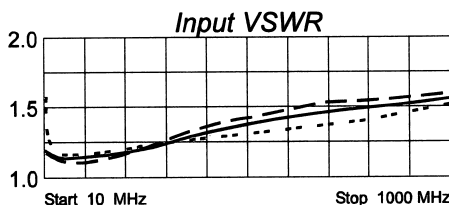
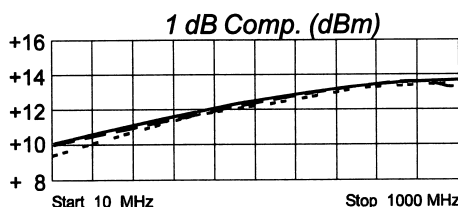
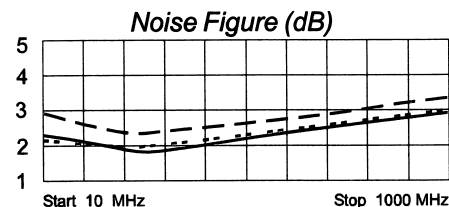
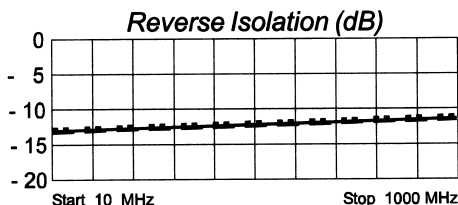
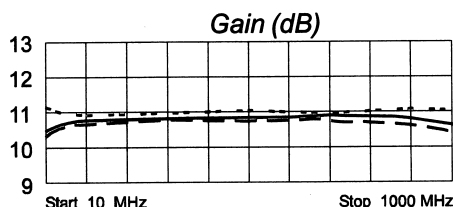
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.06	-83	6.40	-174	.1031	7	.09	91
100	.05	74	6.37	164	.1050	-2	.04	50
200	.10	63	6.25	147	.1064	-5	.06	33
300	.14	53	6.13	131	.1092	-9	.07	18
400	.18	41	6.02	115	.1115	-13	.08	1
500	.20	30	5.94	99	.1156	-17	.09	-17
600	.21	20	5.88	84	.1213	-22	.08	-36
700	.21	8	5.86	68	.1231	-27	.08	-52
800	.20	-6	5.91	51	.1305	-32	.07	-69
900	.16	-23	5.95	33	.1337	-39	.05	-79
1000	.09	-53	6.02	13	.1418	-45	.04	-63

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RF AMPLIFIER

MODEL *TM9144*

Available as: TM9144, 4 Pin TO-8 (T4)
 TN9144, 4 Pin Surface Mount (SM3)
 FP9144, 4 Pin Flatpack (FP4)
 BX9144, Connectorized Housing (H1)
 PN9144, Reduced Size Surface Mount (SM11)

Features

- Low Noise Figure: 3.0 dB Typical
- Medium Output Power: +13 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	13	12 Min.
Power @ 1 dB Comp. (dBm)	+ 13	+ 11 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	3.0	4.0 Max.
Power Vdc	+15	+15
mA	30	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

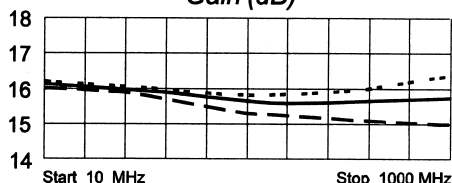
Second Order Harmonic Intercept Point +40 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

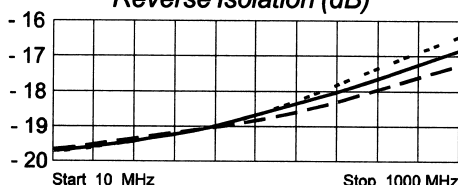
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

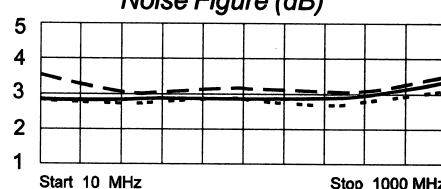
Gain (dB)



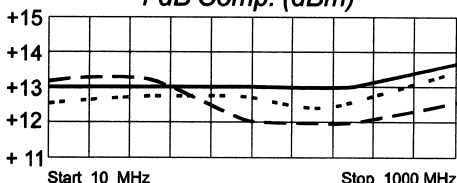
Reverse Isolation (dB)



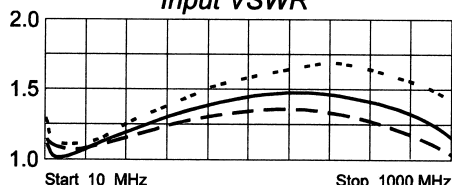
Noise Figure (dB)



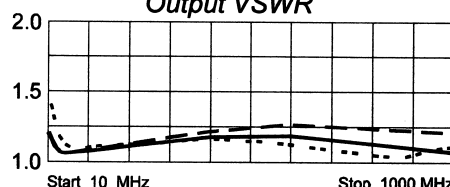
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.06	-83	6.40	-174	.1031	7	.09	91
100	.05	74	6.37	164	.1050	-2	.04	50
200	.10	63	6.25	147	.1064	-5	.06	33
300	.14	53	6.13	131	.1092	-9	.07	18
400	.18	41	6.02	115	.1115	-13	.08	1
500	.20	30	5.94	99	.1156	-17	.09	-17
600	.21	20	5.88	84	.1213	-22	.08	-36
700	.21	8	5.86	68	.1231	-27	.08	-52
800	.20	-6	5.91	51	.1305	-32	.07	-69
900	.16	-23	5.95	33	.1337	-39	.05	-79
1000	.09	-53	6.02	13	.1418	-45	.04	-63

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RF AMPLIFIER

MODEL *TM9157*

Available as: TM9157, 4 Pin TO-8 (T4)
 TN9157, 4 Pin Surface Mount (SM3)
 FP9157, 4 Pin Flatpack (FP4)
 BX9157, Connectorized Housing (H1)

Features

- .3 to 1000 MHz
- Low VSWR: < 1.5:1 Typ.
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	0.3 - 1000 MHz	0.3 to 1000 MHz
Gain (dB)	10.2	8.5 Min.
Power @ 1 dB Comp. (dBm)	+14	+13 Min.
Reverse Isolation (dB)	- 18	- 15 Max.
VSWR In	<1.2:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+15	+15
mA	44	48 Max.

Note: Care should always be taken to effectively ground the case of each unit.

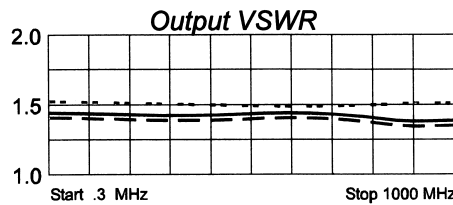
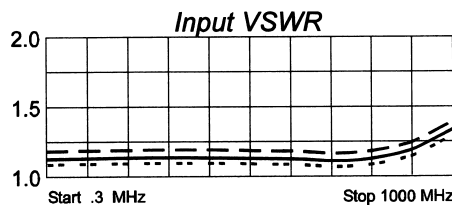
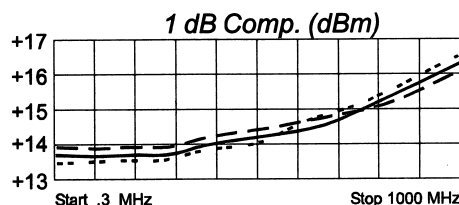
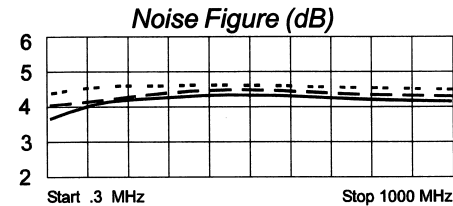
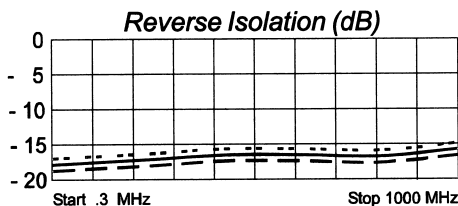
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point+43 (Typ.)
 Second Order Two Tone Intercept Point+37 (Typ.)
 Third Order Two Tone Intercept Point+27 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
3	.02	- 2	3.45	-178	.13	3	.19	-158
5	.05	2	3.36	179	.13	- 0	.20	-179
50	.05	0	3.35	173	.13	- 1	.20	177
100	.05	- 5	3.33	166	.13	- 1	.20	176
200	.05	- 10	3.32	152	.13	- 4	.19	172
400	.06	- 34	3.32	125	.13	- 8	.19	169
600	.07	- 73	3.35	97	.14	-13	.18	168
800	.09	-121	3.42	68	.15	-21	.19	164
1000	.15	-171	3.50	36	.16	-28	.18	158

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RF AMPLIFIER

MODEL *TM9163*

Available as: TM9163, 4 Pin TO-8 (T4)
 TN9163, 4 Pin Surface Mount (SM3)
 FP9163, 4 Pin Flatpack (FP4)
 BX9163, Connectorized Housing (H1)

Features

- Medium Gain: 16 dB Gain Typical
- Low Noise Figure: <2.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16	15.0 Min.
Power @ 1 dB Comp. (dBm)	+5	+3.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<2.5	3.5 Max.
Power Vdc	+15	+15
mA	14	16 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

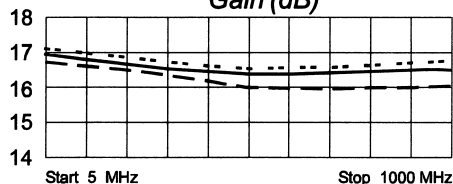
Second Order Harmonic Intercept Point +27 (Typ.)
 Second Order Two Tone Intercept Point +21 (Typ.)
 Third Order Two Tone Intercept Point +16 (Typ.)

Maximum Ratings

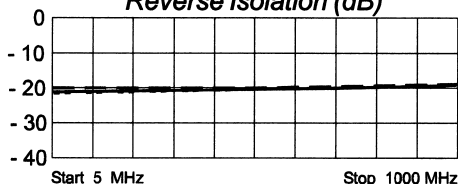
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

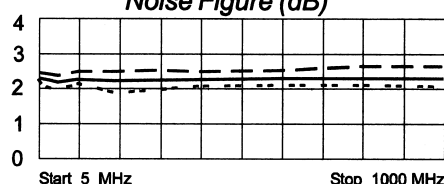
Gain (dB)



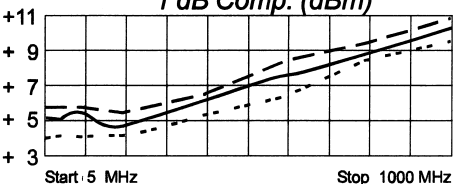
Reverse Isolation (dB)



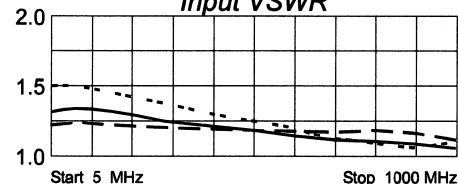
Noise Figure (dB)



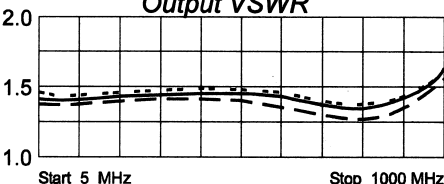
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.13	-173	7.07	-177	.09	4	.17	-176
10	.13	-176	7.04	180	.09	2	.16	179
50	.14	177	6.96	171	.09	- 1	.15	167
100	.13	173	6.91	163	.09	- 0	.16	153
200	.12	166	6.80	146	.09	- 4	.17	128
400	.08	161	6.64	113	.10	-11	.18	91
600	.06	173	6.55	80	.10	-18	.17	69
800	.05	174	6.59	45	.11	-25	.15	73
1000	.02	75	6.56	3	.12	-36	.27	86

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RF AMPLIFIER

MODEL *TM9164*

Available as: TM9164, 4 Pin TO-8 (T4)
 TN9164, 4 Pin Surface Mount (SM3)
 FP9164, 4 Pin Flatpack (FP4)
 BX9164, Connectorized Housing (H1)

Features

- Low Noise Figure: 3.6 dB Typical
- High Gain: 26 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1200 MHz	10 - 1200 MHz
Gain (dB)	26	24.0 Min.
Power @ 1 dB Comp. (dBm)	+8.5	+6.5 Min.
Reverse Isolation (dB)	- 34	- 33 Max.
VSWR In	<1.6:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.6	4.5 Max.
Power Vdc	+15	+15
mA	35	40 Max.

Note: Care should always be taken to effectively ground the case of each unit.

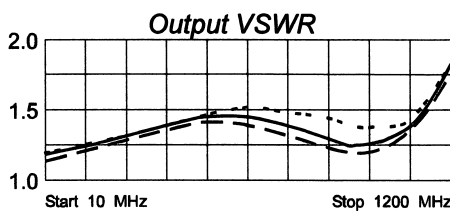
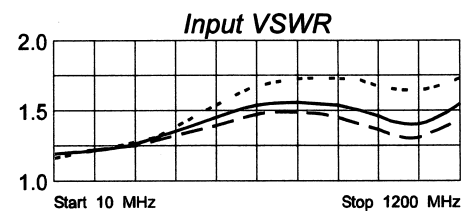
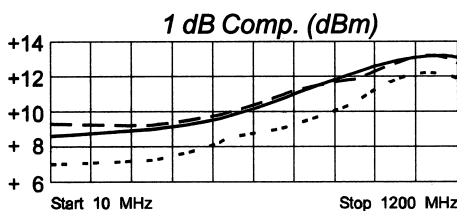
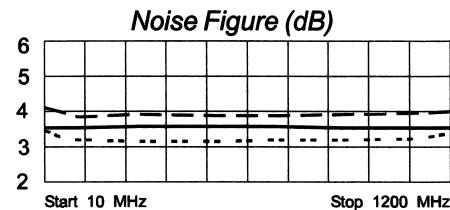
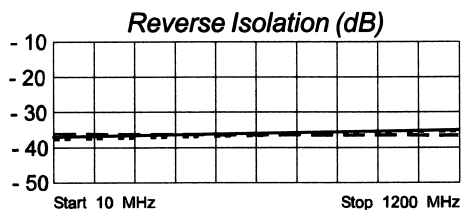
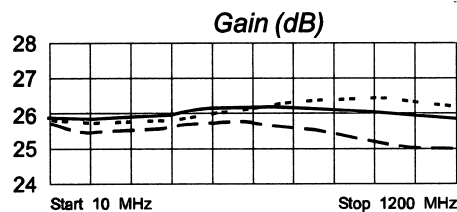
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +39 (Typ.)
 Second Order Two Tone Intercept Point +33 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 6 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.09	-173	19.73	- 1	.01	4	.08	-175
50	.09	-178	19.35	- 12	.01	- 0	.09	-171
100	.09	178	19.33	- 24	.01	- 6	.10	-168
300	.15	155	19.80	- 72	.01	7	.16	-178
500	.21	123	20.59	-122	.01	- 3	.21	157
700	.25	90	20.46	-176	.01	3	.19	126
900	.22	64	19.55	129	.02	0	.12	109
1100	.16	64	19.09	72	.01	- 5	.15	149
1200	.18	77	19.06	40	.02	- 8	.25	140

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RF AMPLIFIER

MODEL *TM9165*

Available as: TM9165, 4 Pin TO-8 (T4)
 TN9165, 4 Pin Surface Mount (SM3)
 FP9165, 4 Pin Flatpack (FP4)
 BX9165, Connectorized Housing (H1)

Features

- Medium Gain: 10.5 dB Typical
- Medium Output Power: +11 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	10.5	9.0 Min.
Power @ 1 dB Comp. (dBm)	+11	+9.0 Min.
Reverse Isolation (dB)	- 15.5	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+15	+15
mA	30	34 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

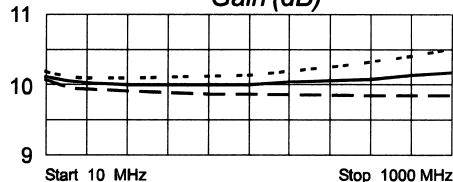
Second Order Harmonic Intercept Point +42 (Typ.)
 Second Order Two Tone Intercept Point +37 (Typ.)
 Third Order Two Tone Intercept Point +24 (Typ.)

Maximum Ratings

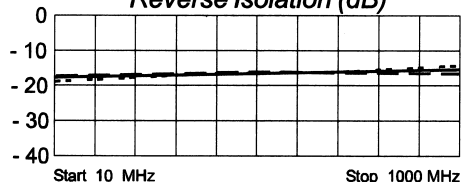
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

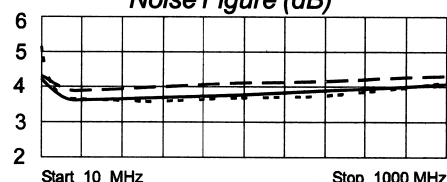
Gain (dB)



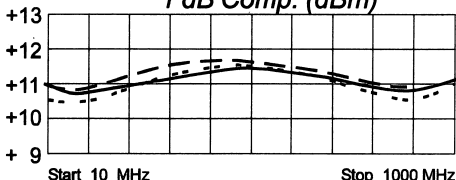
Reverse Isolation (dB)



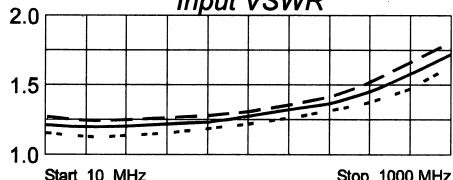
Noise Figure (dB)



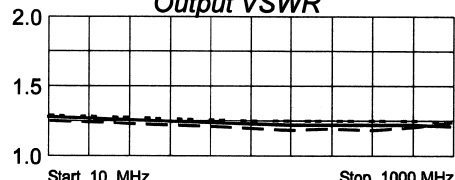
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.10	- 4	3.22	-180	.14	0	.12	-175
50	.09	- 7	3.19	175	.14	- 1	.12	178
100	.09	- 12	3.18	170	.14	- 1	.12	177
300	.10	- 25	3.16	149	.14	- 3	.11	168
500	.12	- 49	3.18	128	.15	- 6	.10	166
700	.16	- 74	3.18	107	.16	- 11	.09	167
900	.22	-104	3.24	85	.16	- 18	.09	174
1000	.27	-119	3.26	73	.16	- 20	.09	-179

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RF AMPLIFIER

MODEL *TM9166*

Available as: TM9166, 4 Pin TO-8 (T4)
 TN9166, 4 Pin Surface Mount (SM3)
 FP9166, 4 Pin Flatpack (FP4)
 BX9166, Connectorized Housing (H1)

Features

- High Gain: 23.5 dB Typical
- Medium Output Power: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1200 MHz	10 - 1200 MHz
Gain (dB)	23.5	22.0 Min.
Power @ 1 dB Comp. (dBm)	+15	+13.5 Min.
Reverse Isolation (dB)	- 30.5	- 29 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	5.5 Max.
Power Vdc	+15	+15
mA	64	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

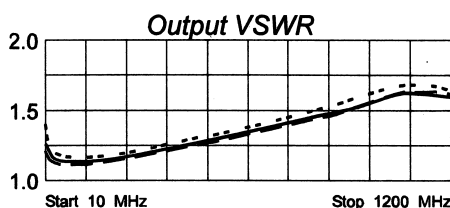
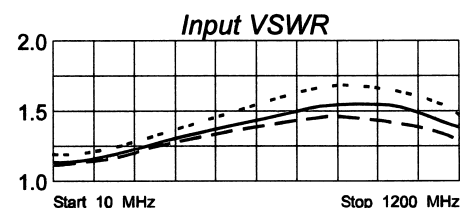
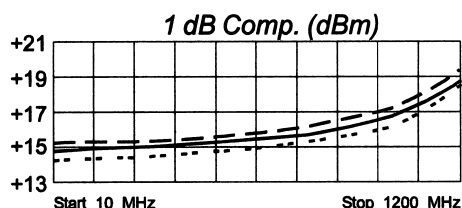
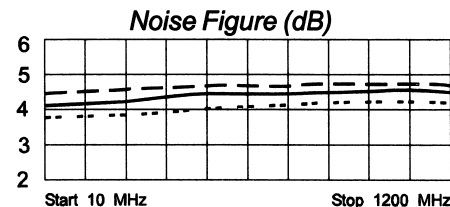
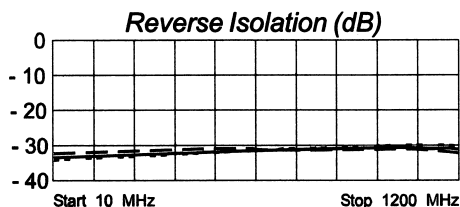
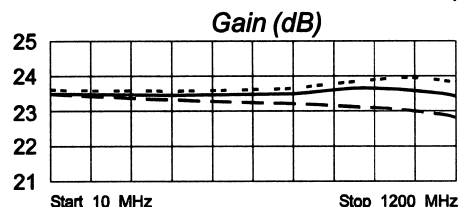
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +46 (Typ.)
 Third Order Two Tone Intercept Point +28 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	163	14.98	5	.02	8	.11	133
50	.07	179	14.98	- 9	.02	2	.06	161
100	.07	-177	15.03	- 21	.02	2	.06	173
300	.12	171	14.98	- 65	.02	2	.09	165
500	.17	138	14.96	-109	.02	- 3	.14	129
700	.23	100	15.10	-154	.03	-10	.18	84
900	.24	57	15.11	159	.03	-19	.21	33
1200	.14	- 25	14.72	82	.03	-41	.23	- 51

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RF AMPLIFIER

MODEL **TM9167**

Available as: TM9167, 4 Pin TO-8 (T4)
 TN9167, 4 Pin Surface Mount (SM3)
 FP9167, 4 Pin Flatpack (FP4)
 BX9167, Connectorized Housing (H1)

Features

- Medium Gain: 12.5 dB Typical
- Medium Output Power: +15.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 800 MHz	10 - 800 MHz
Gain (dB)	12.5	11.5 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+14.5 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	5.5 Max.
Power Vdc	+15	+15
mA	32	35 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

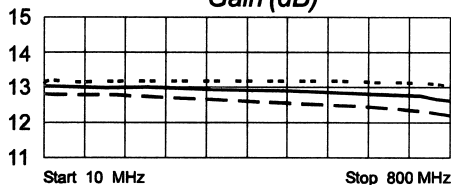
Second Order Harmonic Intercept Point +51 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

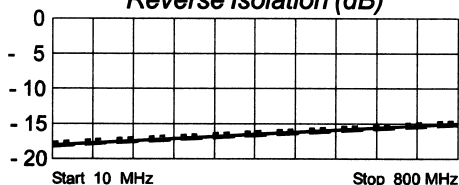
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

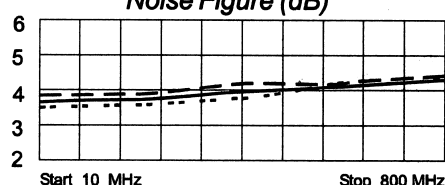
Gain (dB)



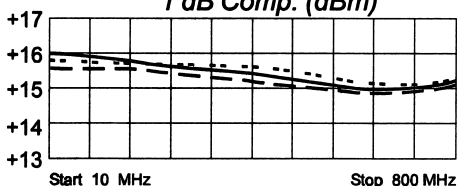
Reverse Isolation (dB)



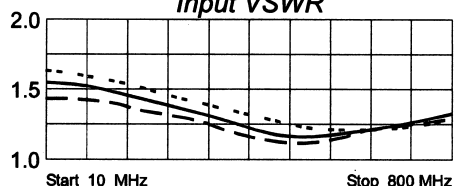
Noise Figure (dB)



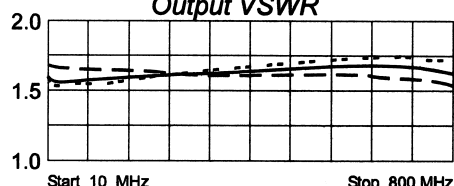
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11— Mag Deg	S21— Mag Deg	S12— Mag Deg	S22— Mag Deg
10	.22 -172	4.49 -179	.13 4	.24 177
50	.21 172	4.49 170	.13 -1	.23 179
100	.21 161	4.48 159	.13 -4	.23 177
200	.18 140	4.45 137	.13 -7	.24 174
400	.11 90	4.42 94	.14 -17	.24 168
600	.08 -13	4.38 48	.16 -32	.25 153
800	.12 -101	4.28 -3	.18 -51	.25 109
1000	.09 144	3.65 -71	.20 -82	.30 -23

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RF AMPLIFIER

MODEL TR9169

Available as: TR9169, 4 Pin TO-8B (T8)
 RN9169, 4 Pin Surface Mount (SM19)
 BR9169, Connectorized Housing (H2)

Features

- High Output Power: +20.5 dBm Typical
- High Third Order Intercept: +33 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +33 (Typ.)

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	25.5	24.0 Min.
Power @ 1 dB Comp. (dBm)	+20.5	+19.0 Min.
Reverse Isolation (dB)	- 36	- 35 Max.
VSWR In	1.6:1	2.0:1 Max.
Out	1.7:1	2.0:1 Max.
Noise figure (dB)	*4.0	*5.5 Max.
Power Vdc	+15	+15
mA	125	135 Max.

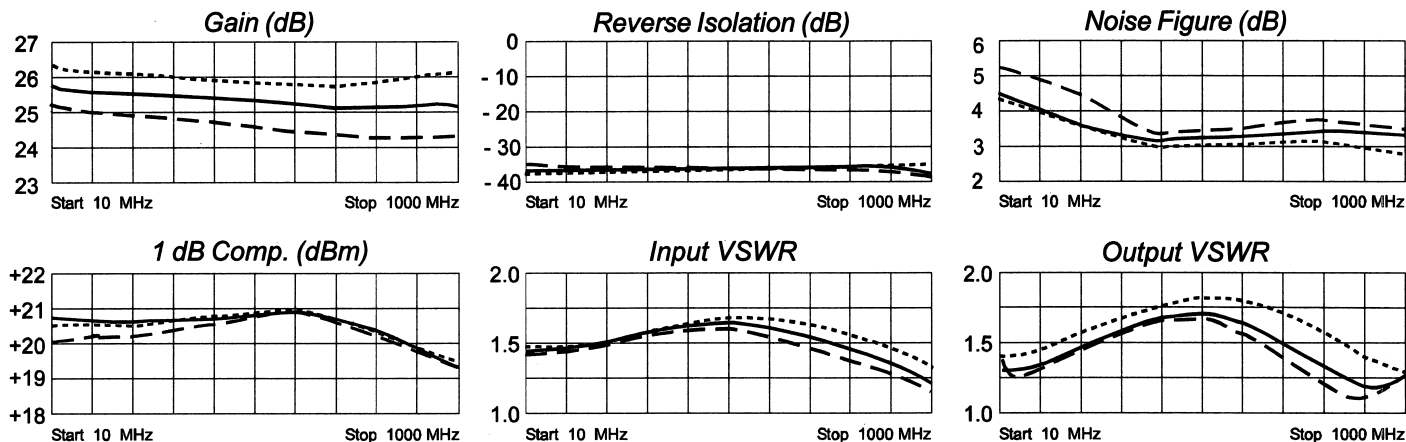
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power.....+13 dBm
 Short Term RF input Power.....50 Milliwatts
 (1 minute Max.)
 Maximum Peak power.....0.5 Watt
 (3 µsec Max.)

* Noise Figure can be Greater below 30MHz.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	162	19.68	5	.02	8	.10	148
100	.07	176	19.52	- 24	.02	- 0	.12	-145
200	.08	170	19.23	- 49	.02	3	.19	-149
400	.11	146	18.95	- 97	.02	10	.28	-174
600	.15	109	19.35	-145	.02	10	.27	156
800	.15	49	19.52	161	.02	6	.15	138
1000	.13	-41	19.69	102	.02	- 2	.17	177

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RF AMPLIFIER

MODEL TR9189

Available as: TR9189, 4 Pin TO-8B (T8)
 BR9189, Connectorized Housing (H2)
 RN9189, 4 PIN Surface Mount (SM19)

Features

- High Gain: 23 dB Typical
- High Output Power: > +25 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 400 MHz	10 - 400 MHz
Gain (dB)	23	22.0 Min.
Power @ 1 dB Comp. (dBm)	+25.5	+24.5 Min.
Reverse Isolation (dB)	- 32	-31 Max
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	5.0	6.0 Max.
Power Vdc	+15	+15
mA	205	220 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

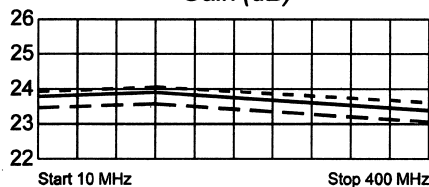
Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +45 (Typ.)
 Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

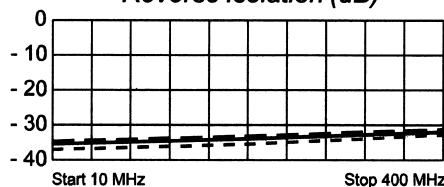
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 95 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

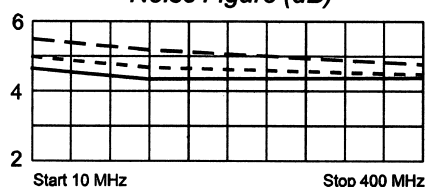
Gain (dB)



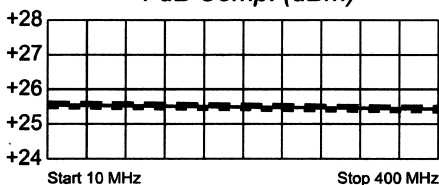
Reverse Isolation (dB)



Noise Figure (dB)



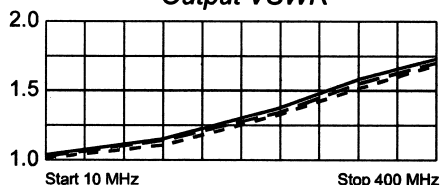
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---- S11 ----		---- S21 ----		---- S12 ----		---- S22 ----	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.09	-167	15.77	3	.0165	5	.10	-110
100	.10	-170	15.75	-51	.0172	-11	.06	-135
200	.15	-167	15.56	-102	.0184	-21	.12	-152
300	.20	-178	15.26	-155	.0200	-36	.19	-176
400	.26	-162	14.72	-152	.0218	-50	.27	-154

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RF AMPLIFIER

MODEL *TM9269*

Available as: TM9269, 4 Pin TO-8 (T4)
 TN9269, 4 Pin Surface Mount (SM3)
 FP9269, 4 Pin Flatpack (FP4)
 BX9269, Connectorized Housing (H1)

Features

- High Gain: 22dB Typical
- High Output Power: 21 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1300MHz	10 - 1200 MHz
Gain (dB)	22	20 Min.
Power @ 1 dB Comp. (dBm)	+21	+20 Min.
Reverse Isolation (dB)	- 36	- 35 Max.
VSWR In	1.7:1	2:1 Max.
Out	1.7:1	2:1 Max.
Noise figure (dB)	4.5	6.0 Max.
Power Vdc	+15	
mA	130	140 Max.

Note: Care should always be taken to effectively ground the case of each unit.

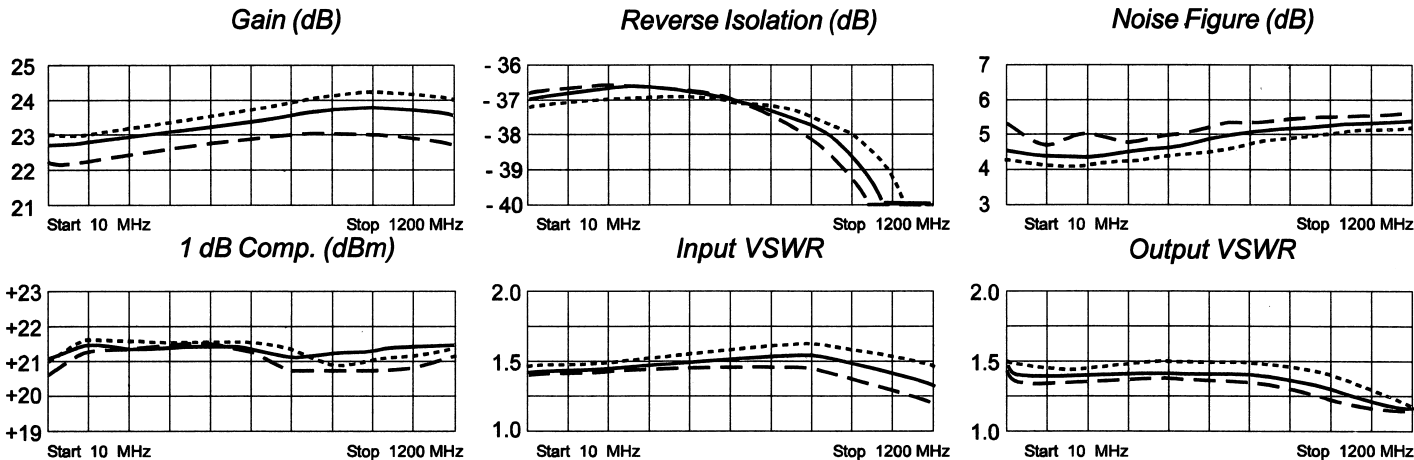
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point+56 (Typ.)
 Second Order Two Tone Intercept Point+50 (Typ.)
 Third Order Two Tone Intercept Point+35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 10 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C . . . -55 °C

Linear S-Parameters

FREQ. MHz	--- S11 --- Mag Deg	--- S21 --- Mag Deg	--- S12 --- Mag Deg	--- S22 --- Mag Deg
10	.13 164	13.75 14	.0142 9	.21 160
100	.13 177	13.74 - 16	.0145 5	.19 169
200	.14 173	13.81 - 35	.0161 12	.19 162
300	.15 167	14.05 - 54	.0165 11	.19 154
400	.16 158	14.17 - 73	.0154 10	.20 145
500	.17 147	14.46 - 92	.0153 12	.20 132
600	.18 134	14.56 -112	.0147 7	.21 119
700	.18 118	14.70 -131	.0137 12	.22 102
800	.17 99	14.82 -152	.0156 15	.21 83
900	.17 78	14.65 -174	.0178 2	.21 62
1000	.16 50	14.53 165	.0143 11	.22 35
1100	.15 14	14.05 143	.0133 18	.22 10
1200	.18 -26	13.70 121	.0104 14	.22 -21

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RF AMPLIFIER

MODEL *TM9302*

Available as: TM9302, 4 Pin TO-8 (T4)
TN9302, 4 Pin Surface Mount (SM3)
FP9302, 4 Pin Flatpack (FP4)
BX9302, Connectorized Housing (H1)
PN9302, Reduced Size Surface Mount (SM11)

Features

- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		1700 - 2300 MHz	1700 - 2300 MHz
Gain (dB)		10.5	9 Min.
Power @ 1 dB Comp. (dBm)		+10	+9 Min.
Reverse Isolation (dB)		- 19	- 17 Max.
VSWR	In	1.75	2.0 Max.
	Out	1.5	2.0 Max.
Noise figure (dB)		> 4	5.5 Max.
Power	Vdc	+15	+15
	mA	21	24 Max.

Note: Care should always be taken to effectively ground the case of each unit.

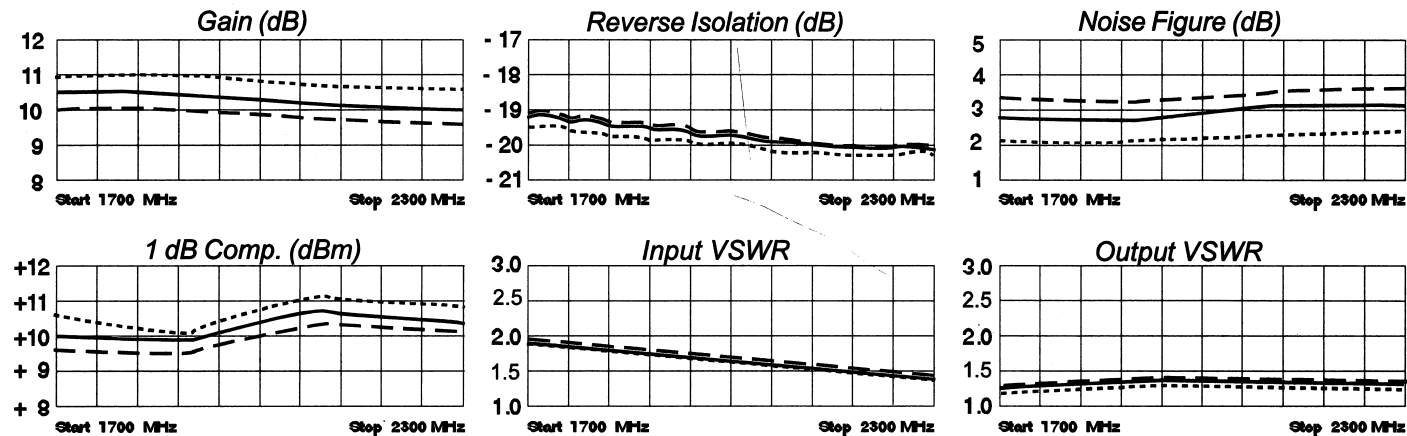
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +34(Typ.)
Second Order Two Tone Intercept Point +28(Typ.)
Third Order Two Tone Intercept Point +22(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 10 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.1 Watt
..... (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
1600	.29	177	3.32	79	.1065	- 51	.06	- 43
1700	.28	166	3.35	71	.1042	- 55	.06	- 57
1800	.28	156	3.34	64	.1000	- 60	.07	- 68
1900	.27	144	3.34	56	.1004	- 63	.07	- 88
2000	.27	131	3.30	48	.0968	- 67	.07	-105
2100	.26	116	3.26	41	.0948	- 71	.06	-120
2200	.25	100	3.27	34	.0922	- 76	.05	-128
2300	.24	83	3.28	27	.0942	- 80	.05	-129
2400	.23	65	3.29	19	.0941	- 88	.06	-124

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03/11/02

RF AMPLIFIER

MODEL *TM9311*

Available as: TM9311, 4 Pin TO-8 (T4)
 TN9311, 4 Pin Surface Mount (SM3)
 FP9311, 4 Pin Flatpack (FP4)
 BX9311, Connectorized Housing (H1)

Features

- Low Noise Figure: 2.3 dB Typical
- Medium Gain: +16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+2	- 1 Min.
Reverse Isolation (dB)	- 18.5	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	2.3	3.0 Max.
Power Vdc	+15	+15
mA	10	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

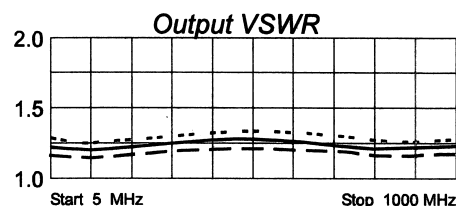
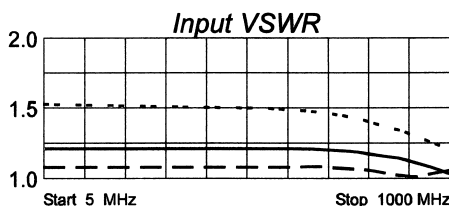
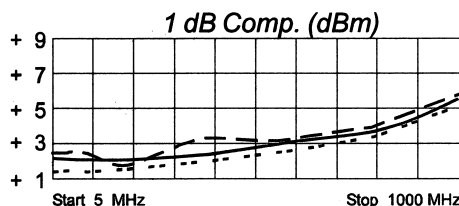
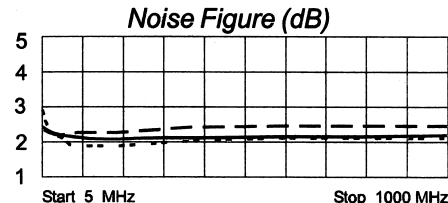
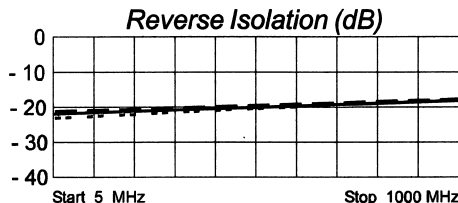
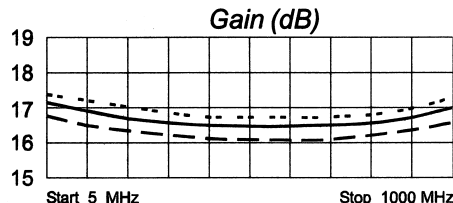
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +23 (Typ.)
 Second Order Two Tone Intercept Point +17 (Typ.)
 Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-173	7.19	-177	.09	4	.10	-172
50	.11	173	7.04	172	.09	-0	.09	159
100	.11	163	6.99	164	.09	-2	.09	140
200	.11	145	6.89	149	.09	-3	.10	109
400	.10	115	6.69	120	.10	-8	.12	63
600	.10	88	6.62	91	.10	-13	.12	29
800	.08	60	6.76	61	.11	-21	.10	9
1000	.02	23	7.14	26	.12	-29	.11	-4

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RF AMPLIFIER

MODEL **TM9312**

Available as: TM9312, 4 Pin TO-8 (T4)
 TN9312, 4 Pin Surface Mount (SM3)
 FP9312, 4 Pin Flatpack (FP4)
 BX9312, Connectorized Housing (H1)

Features

- Low Noise Figure: <3 dB Typical
- Medium Gain: +16.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+7	+5 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

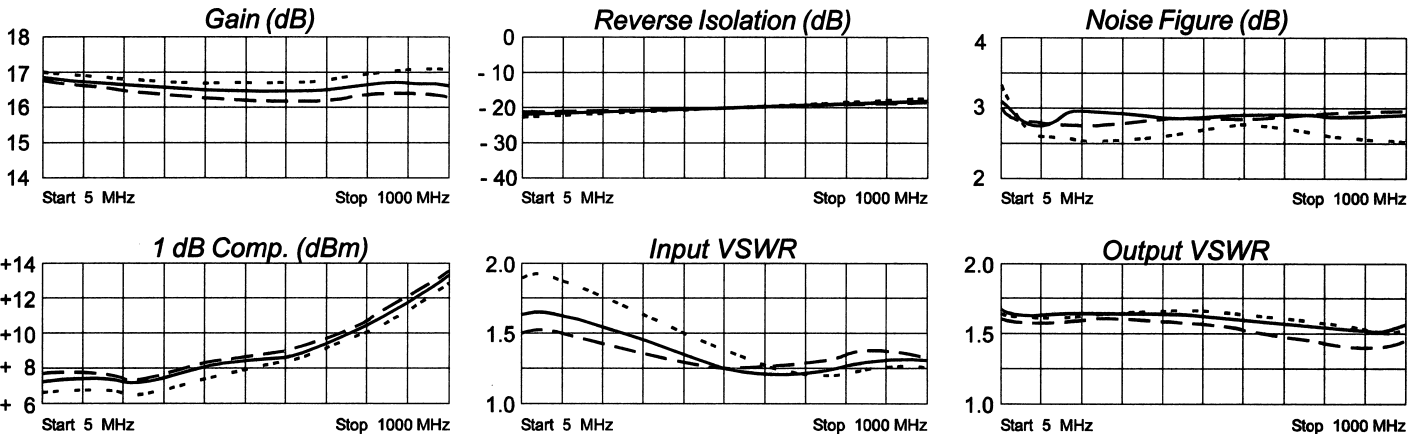
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +30 (Typ.)
 Second Order Two Tone Intercept Point +24 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.24	-174	7.30	-176	.08	4	.26	-176
50	.24	174	6.90	171	.09	- 0	.25	169
100	.23	166	6.88	162	.08	0	.25	160
200	.22	151	6.83	143	.09	- 3	.25	138
400	.15	132	6.69	108	.09	-12	.24	101
600	.10	145	6.65	71	.10	-20	.24	69
800	.13	155	6.78	33	.11	-34	.22	43
1000	.14	120	6.80	- 13	.12	-48	.23	39

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RF AMPLIFIER

MODEL *TM9313*

Available as: TM9313, 4 Pin TO-8 (T4)
 TN9313, 4 Pin Surface Mount (SM3)
 FP9313, 4 Pin Flatpack (FP4)
 BX9313, Connectorized Housing (H1)

Features

- Medium Gain 16 dB Typical
- Medium Output Power: +12 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16	15.0 Min.
Power @ 1 dB Comp. (dBm)	+12	+10.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.5	4.5 Max.
Power Vdc	+15	+15
mA	29	32 Max.

Note: Care should always be taken to effectively ground the case of each unit.

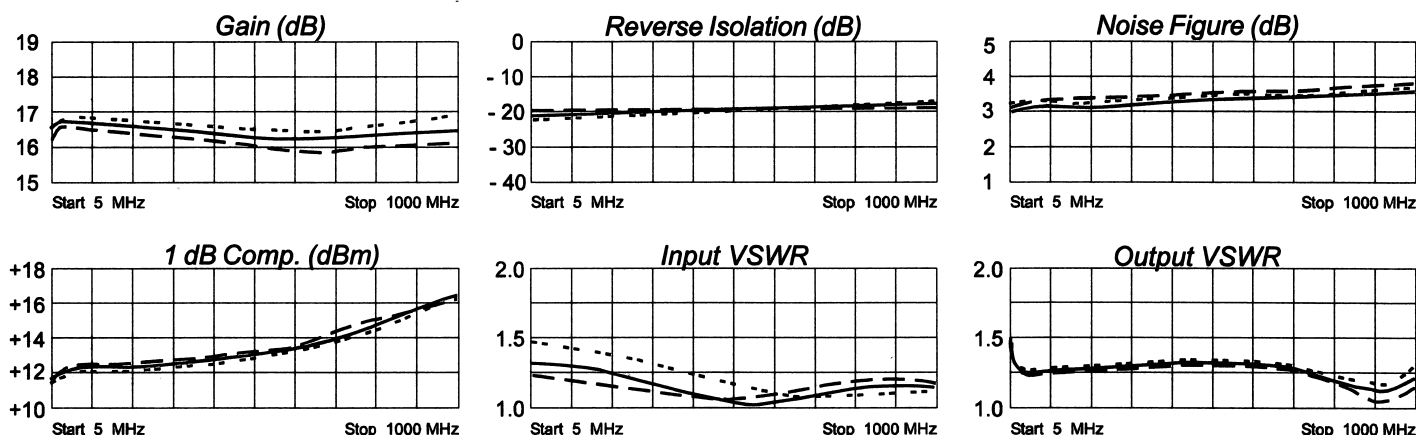
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +41 (Typ.)
 Second Order Two Tone Intercept Point +35 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11 Mag	S11 Deg	S21 Mag	S21 Deg	S12 Mag	S12 Deg	S22 Mag	S22 Deg
5	.15	-133	6.64	-170	.09	12	.18	149
50	.13	178	6.88	173	.09	1	.11	153
100	.13	169	6.84	164	.10	-0	.11	140
200	.11	155	6.78	147	.10	-1	.12	112
400	.06	128	6.62	115	.10	-7	.15	63
600	.01	-94	6.52	84	.11	-14	.14	28
800	.06	-111	6.57	50	.12	-21	.09	5
1000	.06	-149	6.68	12	.13	-31	.10	70

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RF AMPLIFIER

MODEL *TM9316*

Available as: TM9316, 4 Pin TO-8 (T4)
 TN9316, 4 Pin Surface Mount (SM3)
 FP9316, 4 Pin Flatpack (FP4)
 BX9316, Connectorized Housing (H1)

Features

- Low 5 Volt Operation
- Low Noise: 3.0 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1300 MHz	10 - 1200 MHz
Gain (dB)	13	12.0 Min.
Power @ 1 dB Comp. (dBm)	+6	+4.5 Min.
Reverse Isolation (dB)	- 16	- 14 Max.
VSWR In	1.25:1	2.0:1 Max.
Out	1.35:1	2.0:1 Max.
Noise figure (dB)	3	4.0 Max.
Power Vdc	+5	+5
mA	15	18 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

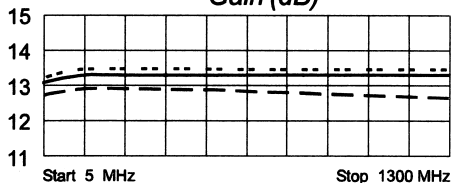
Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

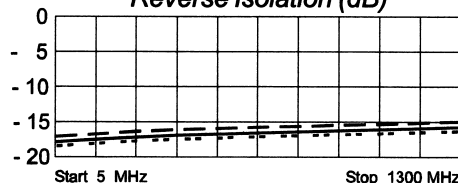
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

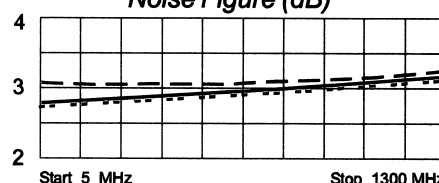
Gain (dB)



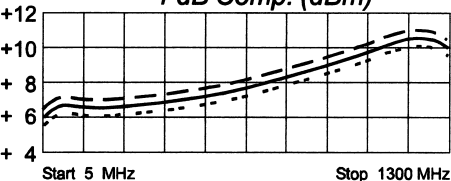
Reverse Isolation (dB)



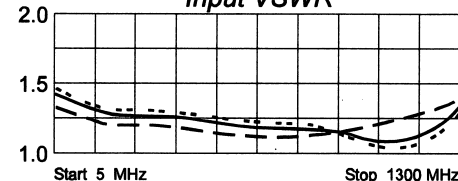
Noise Figure (dB)



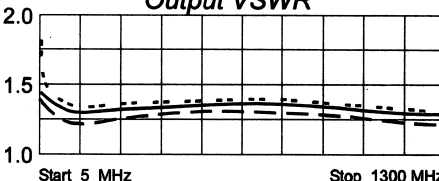
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.14	-155.31	4.51	-175.22	.13	6.49	.14	158.63
100	.14	175.67	4.57	170.22	.13	1.12	.12	154.02
200	.13	161.98	4.57	159.28	.14	1.19	.12	133.81
400	.11	147.92	4.58	138.22	.14	1.50	.12	95.62
600	.07	135.15	4.55	117.40	.15	-.74	.14	57.41
800	.04	155.21	4.52	95.54	.16	-4.29	.14	24.53
1000	.06	-154.82	4.53	73.69	.16	-6.11	.14	-7.08
1200	.13	-153.92	4.56	51.02	.17	-9.16	.14	-36.96
1300	.19	-156.59	4.60	39.64	.17	-9.38	.15	-53.83

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RF AMPLIFIER

MODEL *TM9318*

Available as: TM9318, 4 Pin TO-8 (T4)
 TN9318, 4 Pin Surface Mount (SM3)
 FP9318, 4 Pin Flatpack (FP4)
 BX9318, Connectorized Housing (H1)

Features

- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.5 Min.
Reverse Isolation (dB)	- 18.5	- 17 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	3.75	5.5 Max.
Power Vdc	+15	+15
mA	47	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

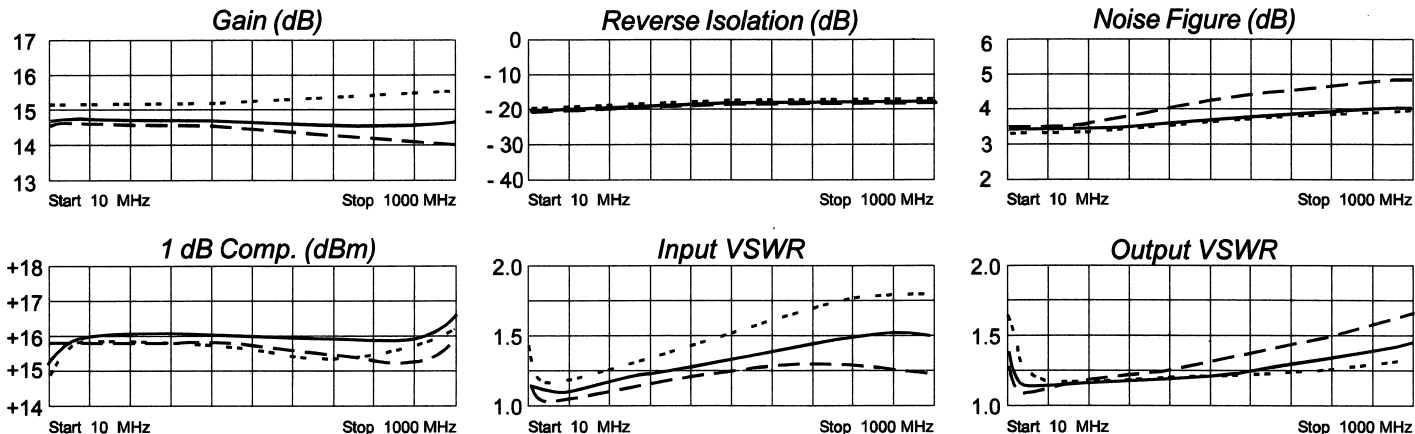
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.11	-78	5.43	-170	.11	11	.16	116
100	.02	117	5.65	167	.11	- 2	.05	84
200	.06	82	5.61	152	.11	- 6	.05	54
400	.11	51	5.52	123	.11	-15	.08	- 6
600	.14	24	5.46	94	.11	-22	.13	- 54
800	.16	-10	5.45	65	.11	-27	.18	- 96
1000	.16	- 61	5.49	34	.10	-32	.22	-139

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RF AMPLIFIER

MODEL *TM9319*

Available as: TM9319, 4 Pin TO-8 (T4)
TN9319, 4 Pin Surface Mount (SM3)
FP9319, 4 Pin Flatpack (FP4)
BX9319, Connectorized Housing (H1)
PN9319, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +22 dBm Typical
- High Third Order Intercept: +35 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+22	+20.0 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.50:1	2.0:1 Max.
Noise figure (dB)	5.5*	7.5* Max.
Power Vdc	+15	+15
mA	90	99 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

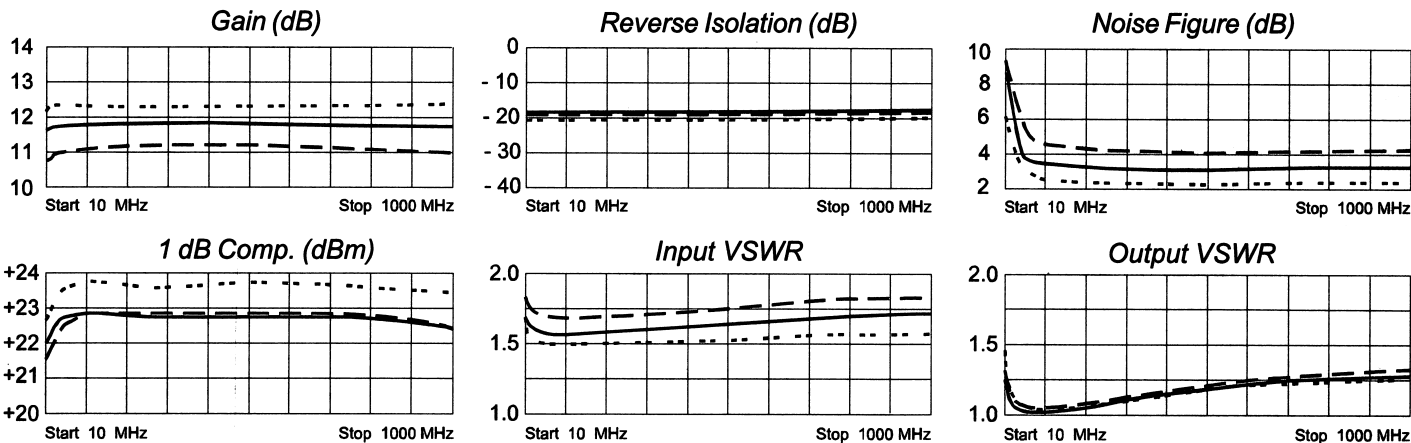
Second Order Harmonic Intercept Point +52 (Typ.)
Second Order Two Tone Intercept Point +46 (Typ.)
Third Order Two Tone Intercept Point +35 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

* Noise Figure is Greater below 20 MHz.

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.26	- 27	3.85	-165	.12	11	.14	99
100	.22	- 18	3.90	175	.12	- 2	.00	7
200	.22	- 30	3.92	167	.12	- 6	.02	- 72
400	.23	- 54	3.91	152	.12	-13	.06	- 93
600	.25	- 77	3.91	138	.12	-21	.09	-106
800	.26	- 98	3.90	124	.12	-29	.11	-116
1000	.27	-118	3.89	109	.12	-38	.13	-123

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RF AMPLIFIER MODEL *TM9322*

Available as: TM9322, 4 Pin TO-8 (T4)
TN9322, 4 Pin Surface Mount (SM3)
FP9322, 4 Pin Flatpack (FP4)
BX9322, Connectorized Housing (H1)

Features

- Medium Gain: 10 dB Typical
- Medium Output Power: +10 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	+9	+7.5 Min.
Reverse Isolation (dB)	- 16	- 13 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.0	6.5 Max.
Power Vdc	+15	+15
mA	25	29 Max.

Note: Care should always be taken to effectively ground the case of each unit.

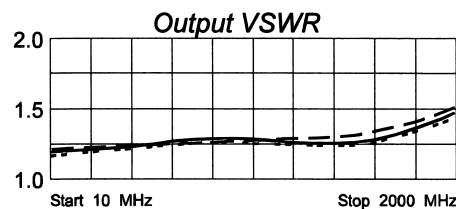
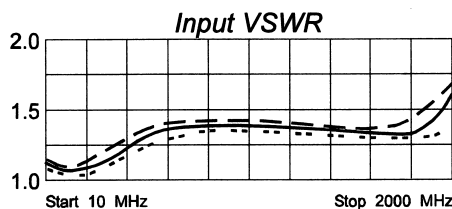
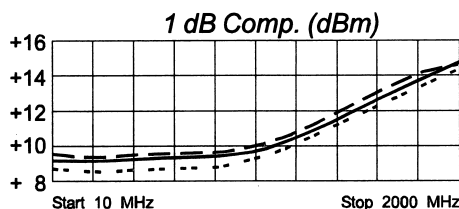
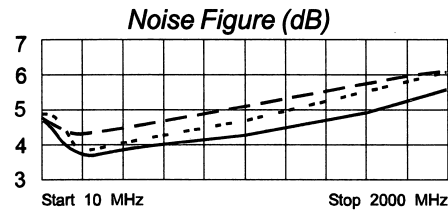
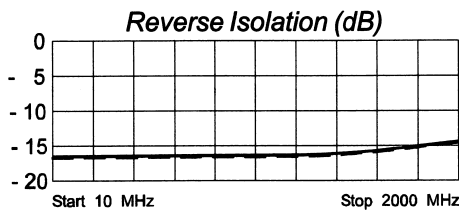
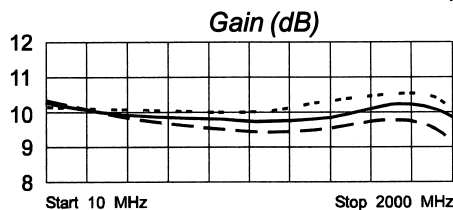
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +41 (Typ.)
Second Order Two Tone Intercept Point +35 (Typ.)
Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	- 9	3.29	-180	.15	1	.07	-178
100	.07	- 30	3.25	168	.15	- 4	.08	153
200	.08	- 57	3.22	156	.15	- 7	.08	130
400	.10	- 99	3.13	133	.15	- 16	.10	88
600	.12	-134	3.06	112	.15	- 24	.12	53
800	.14	-160	3.01	90	.15	- 31	.13	27
1000	.16	173	2.97	69	.15	- 40	.13	- 2
1200	.16	144	3.02	47	.15	- 47	.13	- 33
1400	.16	109	3.10	24	.17	- 56	.12	- 71
1600	.16	65	3.17	- 1	.17	- 66	.13	-108
1800	.17	12	3.18	- 29	.18	- 77	.16	-151
2000	.23	- 36	3.01	- 61	.19	- 92	.19	170

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RF AMPLIFIER

MODEL *TM9323*

Available as: TM9323, 4 Pin TO-8 (T4)
 TN9323, 4 Pin Surface Mount (SM3)
 FP9323, 4 Pin Flatpack (FP4)
 BX9323, Connectorized Housing (H1)

Features

- Medium Gain: 8.5 dB Typical
- Medium Output Power: +15 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	8.5	7.5 Min.
Power @ 1 dB Comp. (dBm)	+15	+14.0 Min.
Reverse Isolation (dB)	- 13	- 11 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	5.5	7.5 Max.
Power Vdc	+15	+15
mA	50	55 Max.

Note: Care should always be taken to effectively ground the case of each unit.

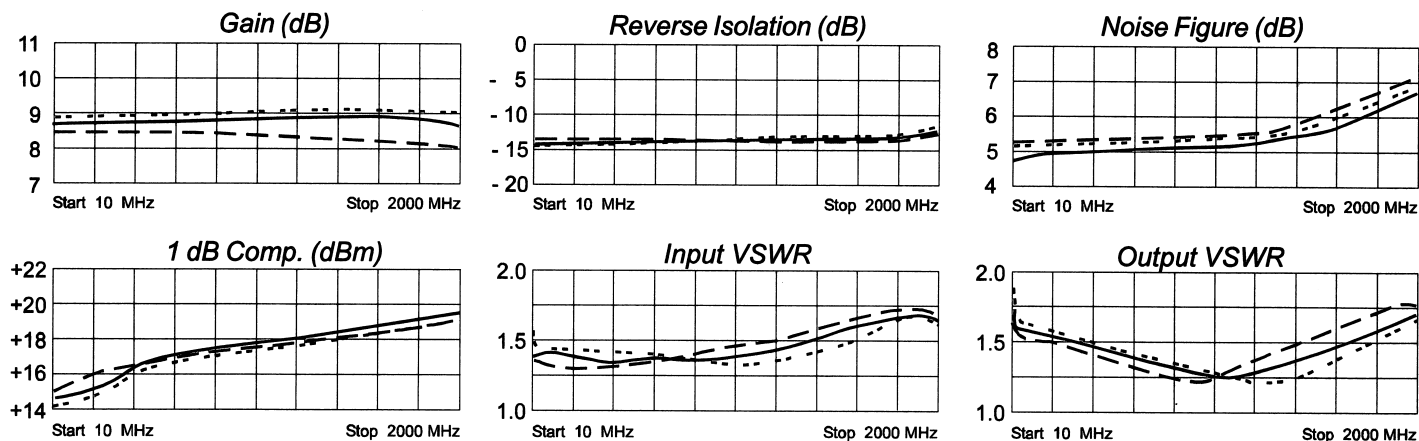
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.16	-134	2.53	-170	.18	13	.26	152
100	.14	-173	2.66	173	.19	2	.18	160
250	.15	-175	2.68	158	.19	1	.17	143
500	.15	-180	2.69	135	.20	- 2	.15	108
750	.15	177	2.70	113	.20	- 6	.12	62
1000	.17	-179	2.73	90	.21	- 9	.11	7
1250	.18	178	2.78	67	.21	-14	.14	- 47
1500	.21	168	2.79	44	.21	-16	.18	- 88
1750	.24	148	2.74	21	.23	-19	.23	-120
2000	.24	117	2.68	- 5	.26	-24	.24	-149

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RF AMPLIFIER

MODEL *TM9324*

Available as: TM9324, 4 Pin TO-8 (T4)
 TN9324, 4 Pin Surface Mount (SM3)
 FP9324, 4 Pin Flatpack (FP4)
 BX9324, Connectorized Housing (H1)

Features

- Medium Gain: 16 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		10 - 2000 MHz	10 - 2000 MHz
Gain (dB)		16	14.0 Min.
Power @ 1 dB Comp. (dBm)		+6.5	+4.5 Min.
Reverse Isolation (dB)		- 28	- 27 Max.
VSWR	In Out	<1.5:1 <1.8:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		4.75	6.0 Max.
Power	Vdc mA	+15 38	+15 43 Max.

Note: Care should always be taken to effectively ground the case of each unit.

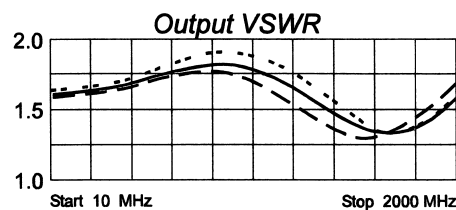
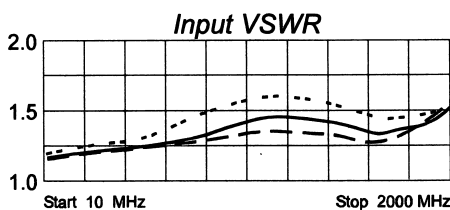
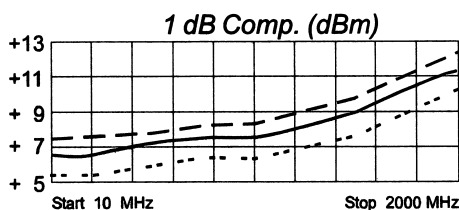
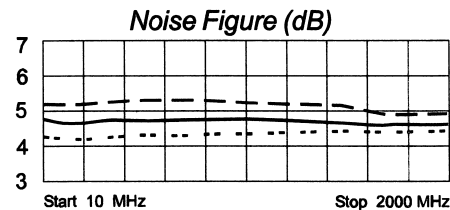
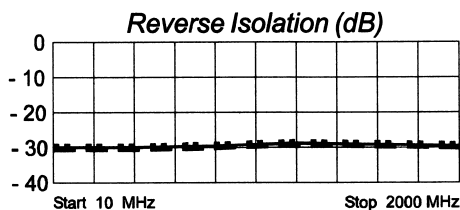
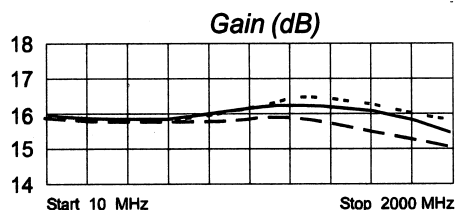
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +43 (Typ.)
 Second Order Two Tone Intercept Point +37 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.10	-173	6.98	0	.03	4	.21	-176
50	.11	177	6.88	-8	.03	-0	.22	-180
100	.11	172	6.84	-16	.03	1	.22	178
250	.12	156	6.83	-39	.03	-4	.24	173
500	.15	129	6.90	-79	.03	-3	.28	158
750	.18	100	7.01	-119	.03	-7	.31	132
1000	.21	70	7.17	-160	.03	-11	.30	98
1250	.18	44	7.04	158	.03	-21	.23	55
1500	.14	39	6.92	117	.03	-43	.15	-9
1750	.16	50	7.04	75	.03	-46	.16	-99
2000	.27	29	7.61	22	.03	-54	.30	-165

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RF AMPLIFIER

MODEL *TM9325*

Available as: TM9325, 4 Pin TO-8 (T4)
 TN9325, 4 Pin Surface Mount (SM3)
 FP9325, 4 Pin Flatpack (FP4)
 BX9325, Connectorized Housing (H1)

Features

- Low Noise Figure: <3.5 dB Typical
- Medium Output Power: > +9 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	14	13.0 Min.
Power @ 1 dB Comp. (dBm)	+9	+7.5 Min.
Reverse Isolation (dB)	- 17	- 16 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+15	+15
mA	24	28 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

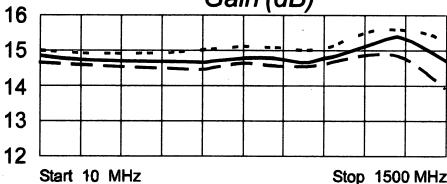
Second Order Harmonic Intercept Point +36 (Typ.)
 Second Order Two Tone Intercept Point +30 (Typ.)
 Third Order Two Tone Intercept Point +22 (Typ.)

Maximum Ratings

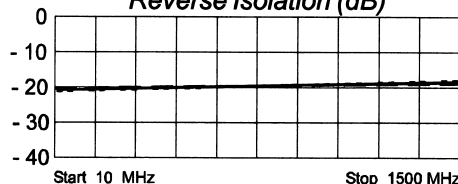
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

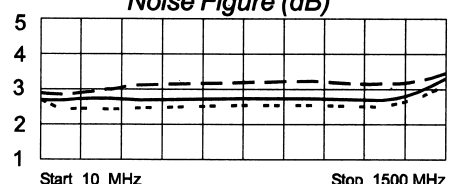
Gain (dB)



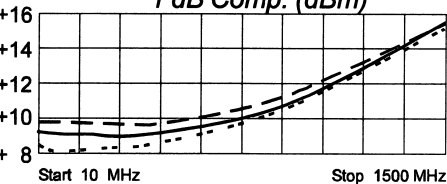
Reverse Isolation (dB)



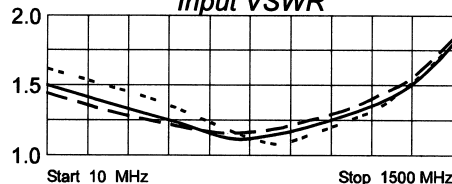
Noise Figure (dB)



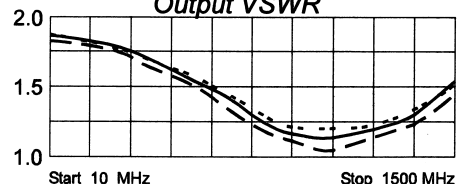
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.19	-178	5.54	-180	.09	2	.30	-178
50	.19	175	5.53	173	.09	2	.30	
100	.19	168	5.52	167	.10	-3	.29	174
250	.16	152	5.46	146	.10	-4	.27	168
500	.09	131	5.42	113	.11	-8	.22	146
750	.04	162	5.51	80	.11	-19	.13	111
1000	.11	-168	5.37	44	.12	-29	.05	70
1250	.17	125	5.73	4	.13	-41	.08	72
1500	.29	31	5.28	-51	.14	-61	.21	87
								32

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RF AMPLIFIER

MODEL *TM9327*

Available as: TM9327, 4 Pin TO-8 (T4)
 TN9327, 4 Pin Surface Mount (SM3)
 FP9327, 4 Pin Flatpack (FP4)
 BX9327, Connectorized Housing (H1)

Features

- Medium Gain: 15 dB Typical
- Medium Output Power: +17.5 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	15	13.0 Min.
Power @ 1 dB Comp. (dBm)	+17.5	+16.0 Min.
Reverse Isolation (dB)	- 27.5	- 26.0 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<6.5	7.5 Max.
Power Vdc	+15	+15
mA	108	118 Max.

Note: Care should always be taken to effectively ground the case of each unit.

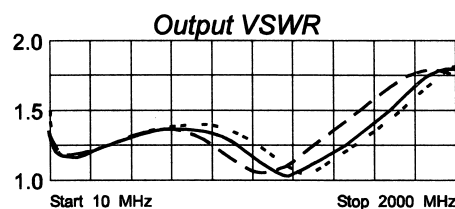
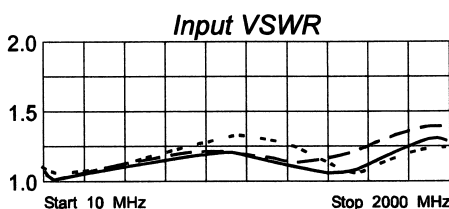
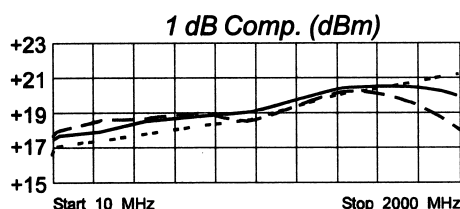
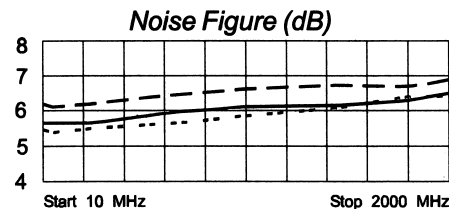
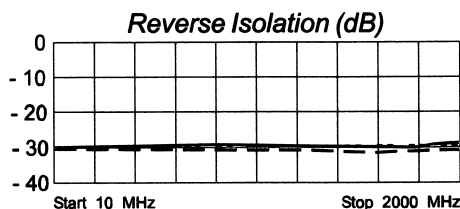
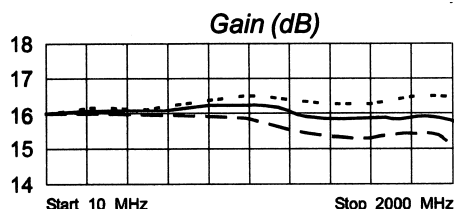
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +44 (Typ.)
 Second Order Two Tone Intercept Point +38 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.03	126	6.32	8	.03	11	.15	136
50	.01	172	6.43	-7	.03	2	.08	164
100	.01	-150	6.44	-17	.03	-1	.08	177
250	.03	-141	6.40	-45	.03	-5	.10	-173
500	.06	-175	6.38	-90	.03	-11	.14	171
750	.08	150	6.44	-134	.03	-16	.14	143
1000	.08	113	6.59	179	.03	-24	.09	104
1250	.05	85	6.37	132	.03	-38	.01	-141
1500	.04	111	6.27	85	.03	-48	.12	-153
1750	.09	105	6.32	35	.04	-55	.22	166
2000	.11	65	5.74	-27	.04	-76	.26	111

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RF AMPLIFIER

MODEL *TM9328*

Available as: TM9328, 4 Pin TO-8 (T4)
 TN9328, 4 Pin Surface Mount (SM3)
 FP9328, 4 Pin Flatpack (FP4)
 BX9328, Connectorized Housing (H1)

Features

- Low Noise Figure: 3.25 dB Typical
- 5 Volt Operation
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	14	12.5 Min.
Power @ 1 dB Comp. (dBm)	+12	+9.0 Min.
Reverse Isolation (dB)	- 16	- 14 Max.
VSWR In	1.6:1	2.0:1 Max.
Out	1.6:1	2.0:1 Max.
Noise figure (dB)	3.25	4.5 Max.
Power Vdc	+5	+5
mA	27	30 Max.

Note: Care should always be taken to effectively ground the case of each unit.

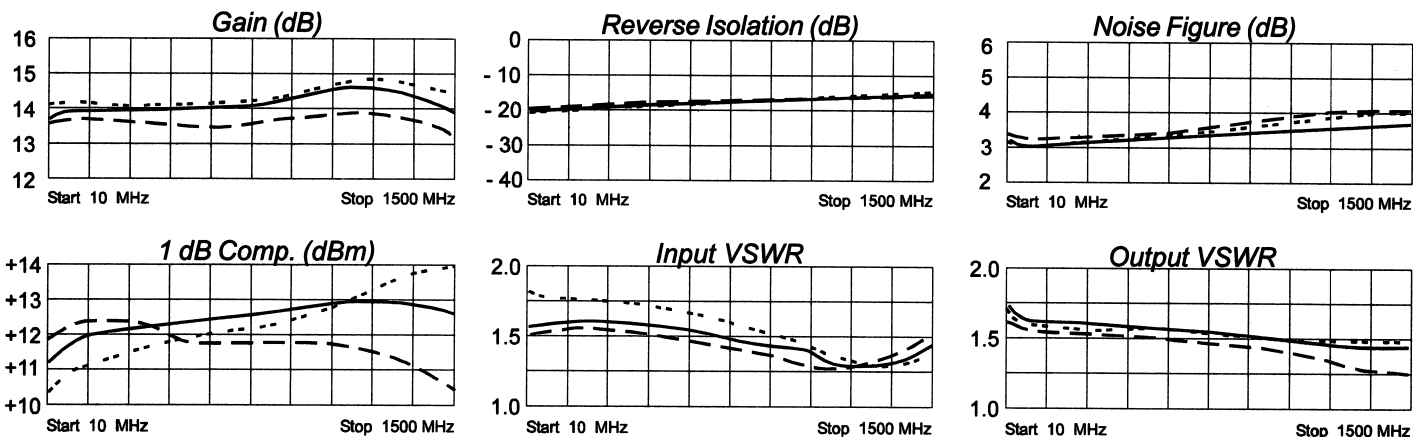
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +31 (Typ.)
 Third Order Two Tone Intercept Point +23 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.22	-155	4.96	-173	.12	8	.25	164
50	.22	-179	5.06	176	.12	3	.22	164
100	.22	175	5.06	169	.12	2	.21	155
250	.21	158	5.06	150	.12	1	.22	128
500	.18	135	5.04	121	.14	- 0	.23	82
750	.13	117	5.12	91	.15	- 6	.24	42
1000	.08	121	5.21	59	.16	-14	.21	6
1250	.10	153	5.16	23	.17	-21	.17	- 26
1500	.16	146	4.70	- 17	.18	-29	.11	- 40

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RF AMPLIFIER

MODEL **TM9329**

Available as: TM9329, 4 Pin TO-8 (T4)
 TN9329, 4 Pin Surface Mount (SM3)
 FP9329, 4 Pin Flatpack (FP4)
 BX9329, Connectorized Housing (H1)
 PN9329, Reduced Size Surface Mount (SM11)

Features

- High Output Power: +20 dBm Typical
- High Third Order Intercept: +39 dBm Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 -1500 MHz	10 - 1500 MHz
Gain (dB)	9.5	8.5 Min.
Power @ 1 dB Comp. (dBm)	+20.0	+19.0 Min.
Reverse Isolation (dB)	- 16	- 15 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	* 4.0	* 8.0 Max.
Power Vdc	+15	+15
mA	90	95 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

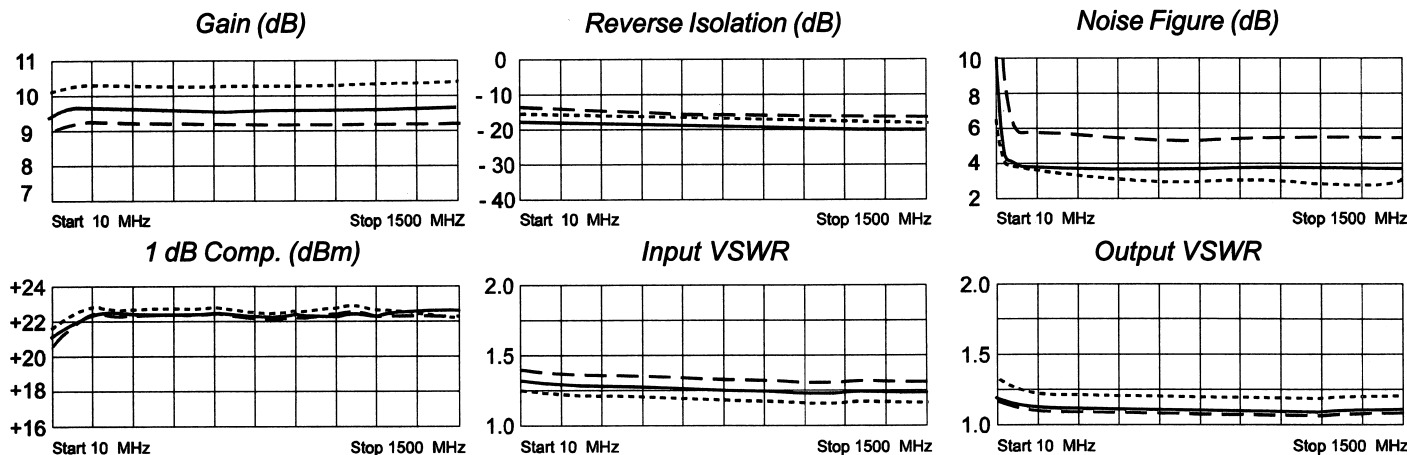
Second Order Harmonic Intercept Point +53 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* NOISE FIGURE IS HIGHER FOR FREQUENCIES BELOW 50 MHZ

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C ····· -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.13	-30	3.02	-172	.135	6	.16	165
100	.09	-14	3.20	175	.142	- 4	.11	168
200	.09	-21	3.18	169	.141	- 8	.10	163
400	.08	-38	3.18	157	.142	- 15	.10	149
600	.08	-55	3.17	145	.141	- 25	.10	138
800	.08	-71	3.16	134	.138	- 33	.10	129
1000	.07	-94	3.19	122	.135	- 43	.10	124
1200	.08	-107	3.20	110	.132	- 51	.09	107
1500	.08	-136	3.26	92	.131	- 64	.10	- 88

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Rev. B 07/02/02

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RF AMPLIFIER MODEL *TM9331*

Available as: TM9331, 4 Pin TO-8 (T4)
TN9331, 4 Pin Surface Mount (SM3)
FP9331, 4 Pin Flatpack (FP4)
BX9331, Connectorized Housing (H1)

Features

- Medium Gain: 11.5 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	11.5	10.5 Min.
Power @ 1 dB Comp. (dBm)	>+2	0 Min.
Reverse Isolation (dB)	- 15	- 14 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.0	4.5 Max.
Power Vdc	+15	+15
mA	11	12 Max.

Note: Care should always be taken to effectively ground the case of each unit.

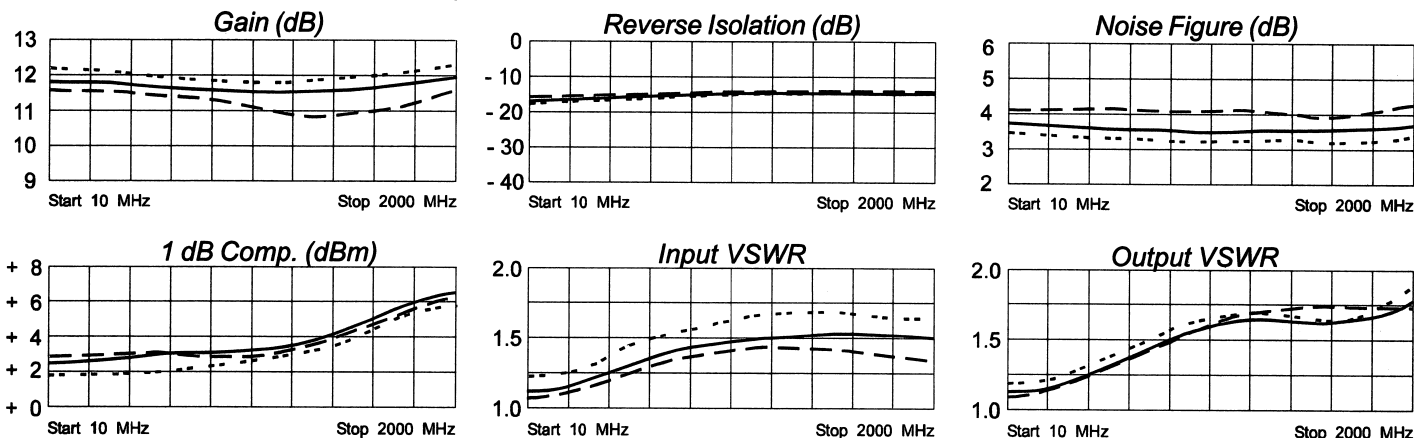
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +27 (Typ.)
Second Order Two Tone Intercept Point +21 (Typ.)
Third Order Two Tone Intercept Point +14 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 6 dBm
Short Term RF Input Power 50 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	-176	3.92	-179	.15	2	.06	-176
100	.07	149	3.90	172	.15	1	.06	141
200	.08	127	3.89	164	.15	2	.08	111
400	.11	89	3.85	150	.15	2	.12	71
600	.14	63	3.83	135	.16	2	.16	43
800	.17	42	3.79	120	.16	1	.19	15
1000	.19	21	2.73	106	.17	- 3	.21	- 9
1200	.20	1	3.72	91	.17	- 5	.23	- 34
1400	.21	- 21	3.74	76	.17	- 9	.24	- 59
1600	.20	- 41	3.84	62	.18	- 10	.25	- 87
1800	.19	- 68	3.99	47	.18	- 11	.26	- 116
2000	.19	- 97	4.10	31	.18	- 12	.27	149

Amplifonix

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RF AMPLIFIER

MODEL *TM9333*

Available as: TM9333, 4 Pin TO-8 (T4)
 TN9333, 4 Pin Surface Mount (SM3)
 FP9333, 4 Pin Flatpack (FP4)
 BX9333, Connectorized Housing (H1)
 PN9333, Reduced Size Surface Mount (SM11)

Features

- Medium Gain: 11.5 dB Typical
- Medium Output Power: +16 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+16.0	+14.0 Min.
Reverse Isolation (dB)	- 15	- 13 Max.
VSWR In	<1.25:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	5.0	6.5 Max.
Power Vdc	+15	+15
mA	48	52 Max.

Note: Care should always be taken to effectively ground the case of each unit.

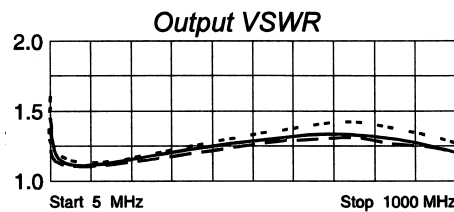
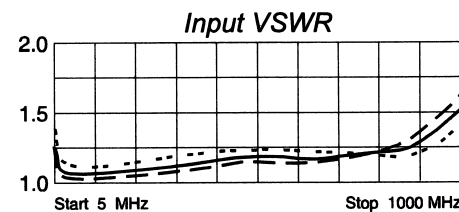
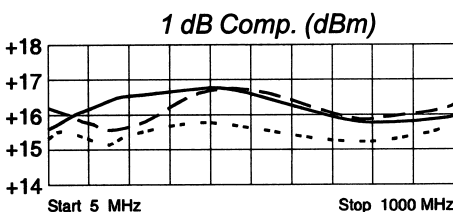
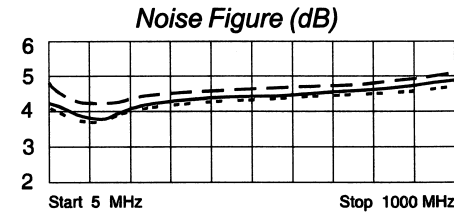
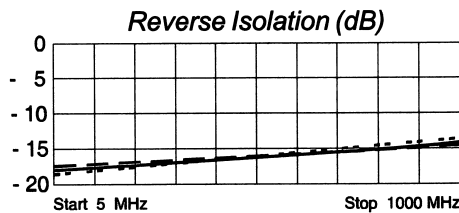
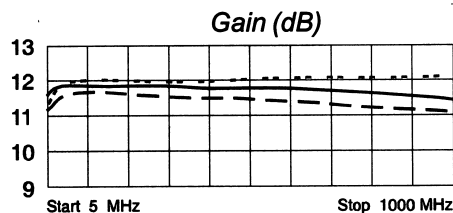
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +50 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +30 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.10	- 97	3.79	-169	.14	13	.03	132
50	.04	174	3.91	174	.15	0	.05	174
100	.04	138	3.91	166	.15	- 1	.05	-175
200	.05	106	3.91	152	.15	- 3	.06	-153
400	.08	59	3.89	123	.16	- 9	.11	-151
600	.09	12	3.86	94	.17	-16	.14	-165
800	.09	- 67	3.82	64	.19	-25	.15	172
1000	.21	-152	3.79	32	.20	-39	.08	150

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RF AMPLIFIER

MODEL **TM9352**

Available as: TM9352, 4 Pin TO-8 (T4)
 TN9352, 4 Pin Surface Mount (SM3)
 FP9352, 4 Pin Flatpack (FP4)
 BX9352, Connectorized Housing (H1)
 PN9352, Reduced Size Surface Mount (SM11)

Features

- Low 5 Volt Bias
- Medium Gain: +10 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Gain (dB)	10	8.5 Min.
Power @ 1 dB Comp. (dBm)	+8.0	+5.0 Min.
Reverse Isolation (dB)	- 13	- 12 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.75:1	2.0:1 Max.
Noise figure (dB)	4.0	5.5 Max.
Power Vdc	+5	+5
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

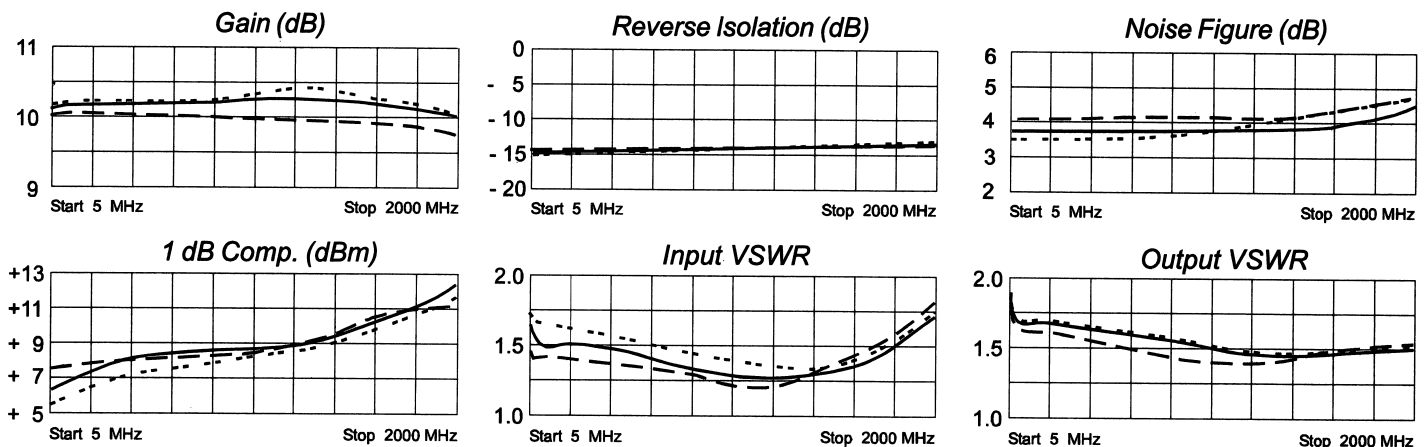
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +33 (Typ.)
 Second Order Two Tone Intercept Point +28 (Typ.)
 Third Order Two Tone Intercept Point +20 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.22	-21	3.33	-170	.1212	5	.11	160
100	.20	-11	3.35	175	.1205	-3	.10	174
200	.20	-20	3.34	168	.1194	-6	.09	176
400	.21	-37	3.33	155	.1207	-12	.09	175
600	.22	-54	3.32	143	.1224	-19	.08	179
800	.23	-69	3.34	130	.1215	-27	.08	-180
1000	.24	-84	3.36	117	.1244	-33	.08	-177
1200	.25	-96	3.39	104	.1240	-43	.08	-174
1400	.25	-111	3.41	91	.1275	-50	.09	-176
1600	.25	-125	3.47	77	.1270	-59	.08	179
1800	.24	-143	3.56	63	.1321	-72	.06	172
2000	.21	-174	3.57	46	.1313	-81	.04	173

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RF AMPLIFIER

MODEL **TM9355**

Available as: TM9355, 4 Pin TO-8 (T4)
 TN9355, 4 Pin Surface Mount (SM3)
 FP9355, 4 Pin Flatpack (FP4)
 BX9355, Connectorized Housing (H1)
 PN9355, Reduced Size Surface Mount (SM11)

Features

- Medium Gain: 16.5 dB Typical
- Low Noise Figure: <3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+6	+4.0 Min.
Reverse Isolation (dB)	- 18.5	- 17.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	16	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

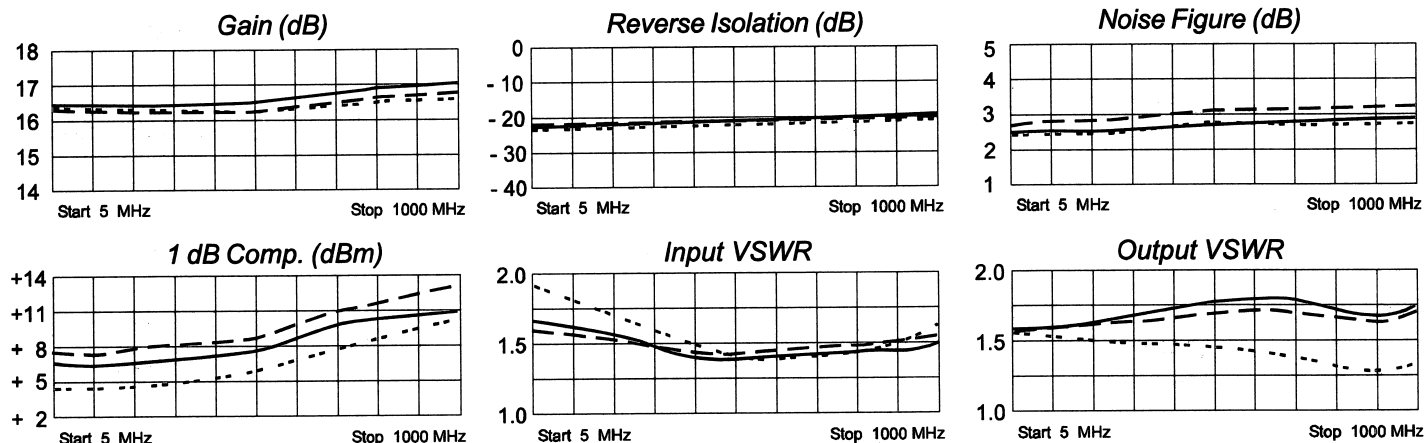
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +31 (Typ.)
 Second Order Two Tone Intercept Point +25 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
10	.22	-21	3.33	-170	.1212	5	.11	160
100	.20	-11	3.35	175	.1205	-3	.10	174
200	.20	-20	3.34	168	.1194	-6	.09	176
400	.21	-37	3.33	155	.1207	-12	.09	175
600	.22	-54	3.32	143	.1224	-19	.08	179
800	.23	-69	3.34	130	.1215	-27	.08	-180
1000	.24	-84	3.36	117	.1244	-33	.08	-177
1200	.25	-96	3.39	104	.1240	-43	.08	-174
1400	.25	-111	3.41	91	.1275	-50	.09	-176
1600	.25	-125	3.47	77	.1270	-59	.08	179
1800	.24	-143	3.56	63	.1321	-72	.06	172
2000	.21	-174	3.57	46	.1313	-81	.04	173

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RF AMPLIFIER

MODEL *TM9363*

Available as: TM9363, 4 Pin TO-8 (T4)
 TN9363, 4 Pin Surface Mount (SM3)
 FP9363, 4 Pin Flatpack (FP4)
 BX9363, Connectorized Housing (H1)
 PN9363, Reduced Size Surface Mount (SM11)

Features

- High Gain: 16.5 dB Typical
- Low Noise Figure: <3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Gain (dB)	16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)	+6	+4.0 Min.
Reverse Isolation (dB)	- 18.5	- 17.5 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+15	+15
mA	16	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

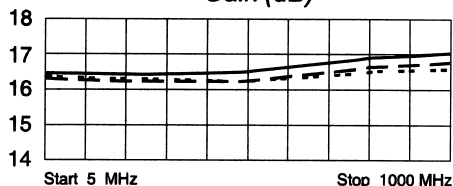
Second Order Harmonic Intercept Point +31 (Typ.)
 Second Order Two Tone Intercept Point +25 (Typ.)
 Third Order Two Tone Intercept Point +19 (Typ.)

Maximum Ratings

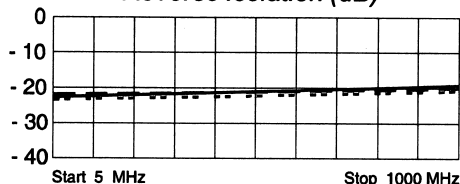
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data

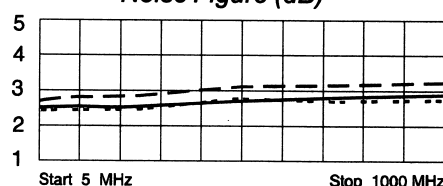
Gain (dB)



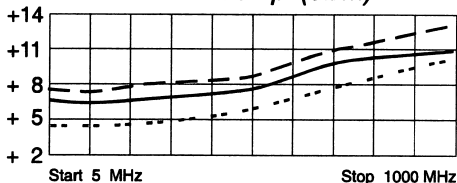
Reverse Isolation (dB)



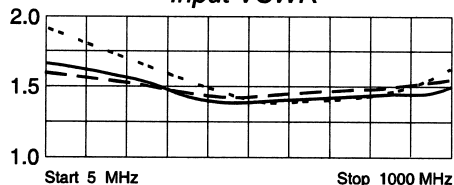
Noise Figure (dB)



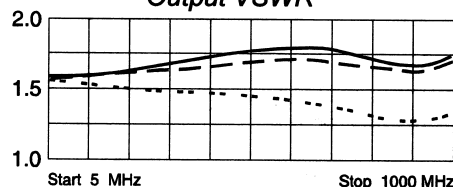
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg
5	.21	-176	6.77	-176	.09	5	.23	-175
50	.21	175	6.72	172	.09	- 1	.22	169
100	.20	170	6.69	163	.09	- 2	.22	159
200	.19	161	6.58	147	.09	- 4	.22	138
400	.14	148	6.39	115	.10	- 8	.21	99
600	.10	149	6.29	84	.10	-15	.18	67
800	.09	154	6.32	51	.11	-21	.13	35
1000	.06	-173	6.13	14	.12	-33	.04	95
1200	.07	-167	5.92	- 27	.13	-45	.19	107

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RF AMPLIFIER

MODEL *TM9366*

Available as: TM9366, 4 Pin TO-8 (T4)
 TN9366, 4 Pin Surface Mount (SM3)
 FP9366, 4 Pin Flatpack (FP4)
 BX9366, Connectorized Housing (H1)

Features

- High Gain: 27.5 dB Typical
- Low Noise Figure: <4 dB Typical
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	27.5	25.5 Min.
Power @ 1 dB Comp. (dBm)	+15	+13.5 Min.
Reverse Isolation (dB)	- 36	- 34 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.0 Max.
Power Vdc	+15	+15
mA	63	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

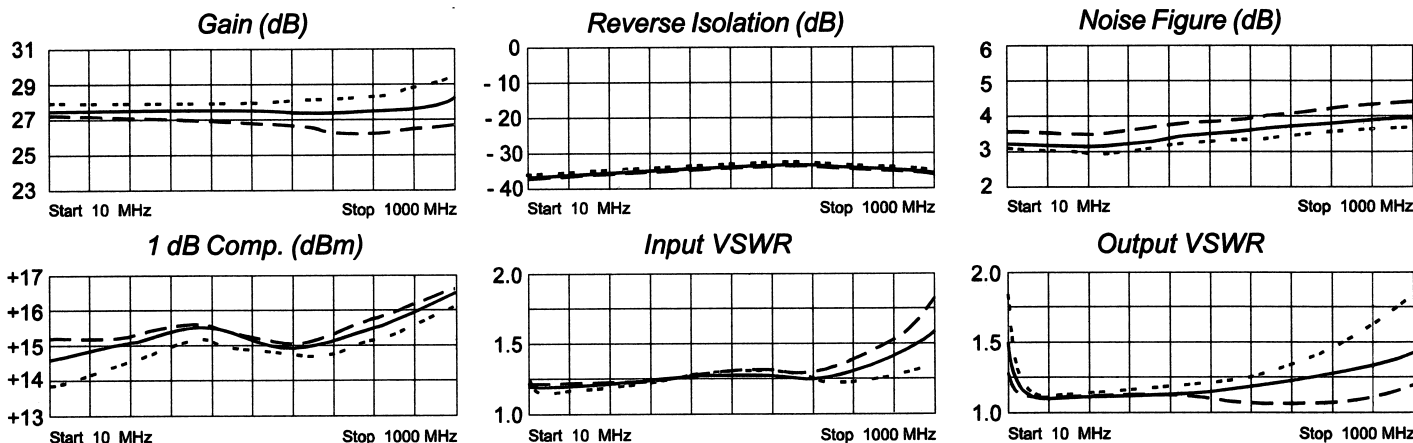
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +37 (Typ.)
 Second Order Two Tone Intercept Point +32 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.18	33	22.77	23	.01	24	.36	113
10	.19	13	23.76	10	.01	12	.17	99
50	.18	- 10	23.90	- 9	.02	8	.05	76
100	.18	- 22	23.93	- 21	.01	2	.04	66
200	.17	- 47	24.04	- 44	.01	3	.04	54
400	.15	- 93	23.87	- 89	.01	- 6	.04	41
600	.12	-129	23.38	-134	.02	1	.05	75
800	.10	-130	23.59	-178	.02	-12	.12	91
1000	.24	-135	25.96	132	.02	-26	.31	62

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RF AMPLIFIER

MODEL *TM9511*

Available as: TM9511, 4 Pin TO-8 (T4)
TN9511, 4 Pin Surface Mount (SM3)
FP9511, 4 Pin Flatpack (FP4)
BX9511, Connectrized Housing (H1)
PN9511, Reduced Size Surface Mount (SM11)

- Features**
- Low Noise Figure: <2.3 dB Typical
 - High Gain: +16.5 dB Typical
 - Operating Temp. - 55 °C to +85 °C
 - Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		5 - 1000 MHz	5 - 1000 MHz
Gain (dB)		16.5	15.0 Min.
Power @ 1 dB Comp. (dBm)		+1	- 1 Min.
Reverse Isolation (dB)		- 18.5	- 18 Max.
VSWR	In Out	<1.5:1 <1.5:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		2.3	3.0 Max.
Power	Vdc mA	+15 9.5	+15 11 Max.

Note: Care should always be taken to effectively ground the case of each unit.

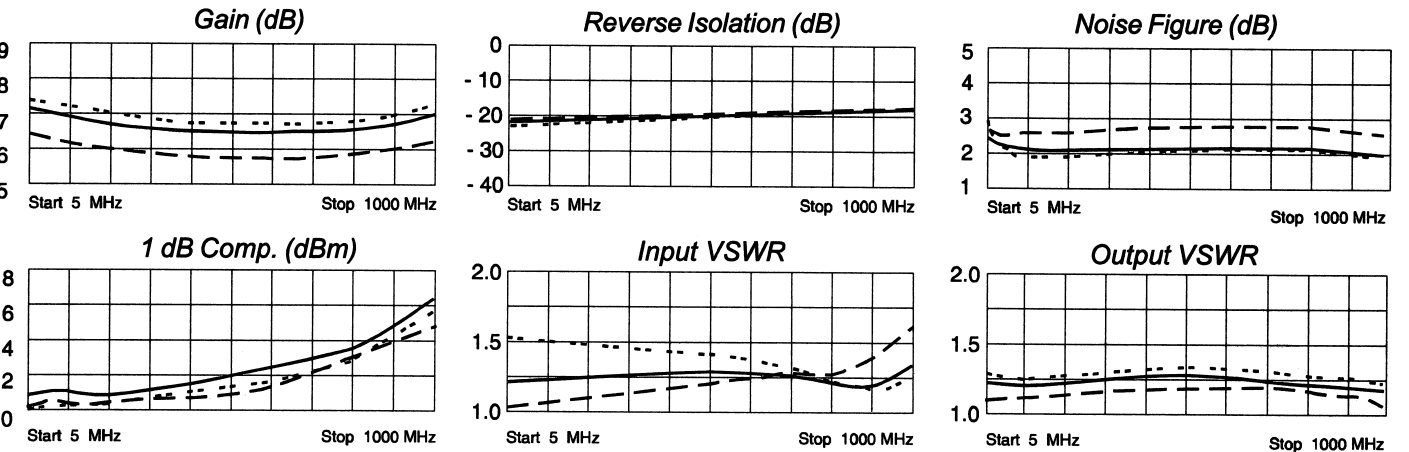
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +21(Typ.)
Second Order Two Tone Intercept Point +16(Typ.)
Third Order Two Tone Intercept Point +14(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power.....0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
5	.11	-173	7.19	-177	.09	4	.10	-172
50	.11	173	7.04	172	.09	- 0	.09	159
100	.11	163	6.99	164	.09	- 2	.09	140
200	.11	145	6.89	149	.09	- 3	.10	109
400	.10	115	6.69	120	.10	- 8	.12	63
600	.10	88	6.62	91	.10	-13	.12	29
800	.08	60	6.76	61	.11	-21	.10	9
1000	.02	23	7.14	26	.12	-29	.11	- 4



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RF AMPLIFIER

MODEL TM9518

Available as: TN9518, 4 Pin Surface Mount (SM3)
BX9518 Connectorized Housing (HI)

Features

- Medium Gain: +16 dB Typical
- Operating Temp. - 55 °C to +85 °C

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	14.7	13.5 Min.
Power @ 1 dB Comp. (dBm)	+16	+14.5 Min.
Reverse Isolation (dB)	- 18.5	- 17 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	4.0	5.5 Max.
Power Vdc	+15	+15
mA	44	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

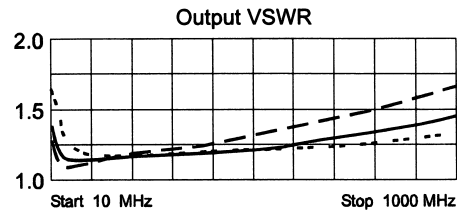
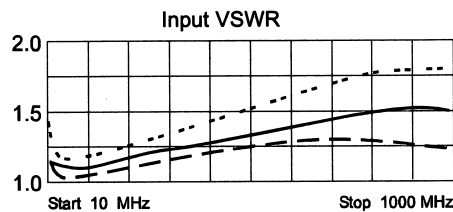
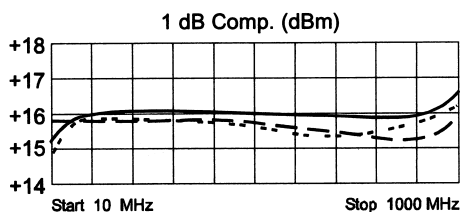
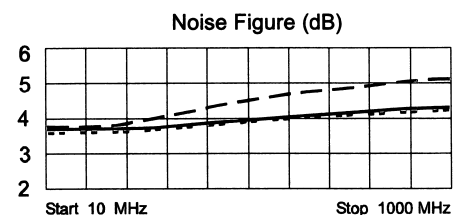
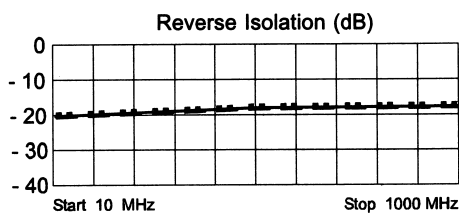
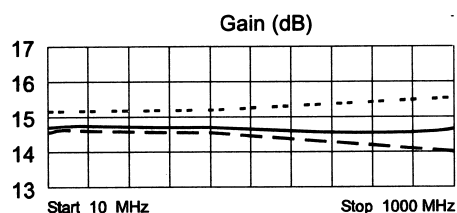
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +47(Typ.)
Second Order Two Tone Intercept Point +41(Typ.)
Third Order Two Tone Intercept Point +29(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.17	-160	5.20	-176	.11	6	.19	163
50	.17	-174	5.27	-171	.12	-2	.17	169
100	.16	-160	5.25	-161	.12	-6	.16	163
200	.14	-134	5.24	-141	.12	-12	.14	150
400	.08	51	5.25	-102	.13	-26	.06	131
600	.15	-50	5.27	60	.13	-45	.06	-108
800	.23	-107	5.21	15	.14	-65	.16	-137
1000	.10	-171	5.11	-37	.14	-87	.15	-177

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RF AMPLIFIER

MODEL **TM9522**

Available as: TM9522, 4 Pin TO-8 (T4)
 TN9522-3, 4 Pin Surface Mount (SM3)
 FP9522-4, 4 Pin Flatpack (FP4)
 BX9522, Connectorized Housing (H1)

Features

- High Gain: 20.5 dB Typical
- Medium Output Power: +14 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1500 MHz	5 - 1500 MHz
Gain (dB)	20.5	18.5 Min.
Power @ 1 dB Comp. (dBm)	+14.0	+10.0 Min.
Reverse Isolation (dB)	- 30	- 27 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<5.0	6.0 Max.
Power Vdc	+15	+15
mA	64	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

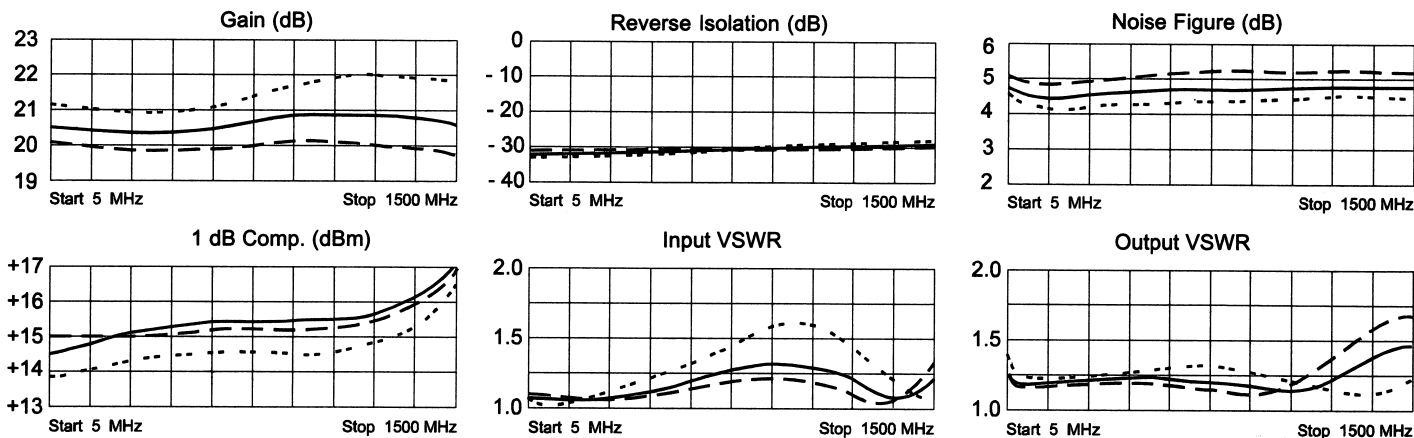
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +42 (Typ.)
 Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.02	50	10.68	5	.03	8	.12	145
50	.01	- 33	10.64	- 11	.03	- 1	.08	166
100	.02	- 74	10.62	- 24	.03	- 8	.08	172
300	.05	-154	10.50	- 71	.03	- 19	.09	166
500	.10	156	10.61	-119	.03	- 35	.10	151
700	.17	110	10.95	-167	.03	- 54	.07	133
900	.20	65	11.55	143	.03	- 64	.07	117
1100	.19	20	11.83	89	.03	- 83	.05	146
1300	.11	- 30	11.55	32	.03	-100	.12	160
1500	.07	102	10.77	- 27	.03	-125	.21	128

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RF AMPLIFIER

MODEL TM9524

Available as: TM9524, 4 Pin TO-8 (T4)
 TN9524-3, 4 Pin Surface Mount (SM3)
 FP9524-4, 4 Pin Flatpack (FP4)
 BX9524, Connectorized Housing (H1)

Features

- High Gain: 22 dB Typical
- Medium Output Power: +13 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1500 MHz	10 - 1500 MHz
Gain (dB)	22.0	20.0 Min.
Power @ 1 dB Comp. (dBm)	+13	+10.0 Min.
Reverse Isolation (dB)	- 33	- 30 Max.
VSWR In	<1.75:1	2.0:1 Max.
VSWR Out	<1.75:1	2.2:1 Max.
Noise figure (dB)	4.3	5.0 Max.
Power Vdc	+15	+15
mA	56	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

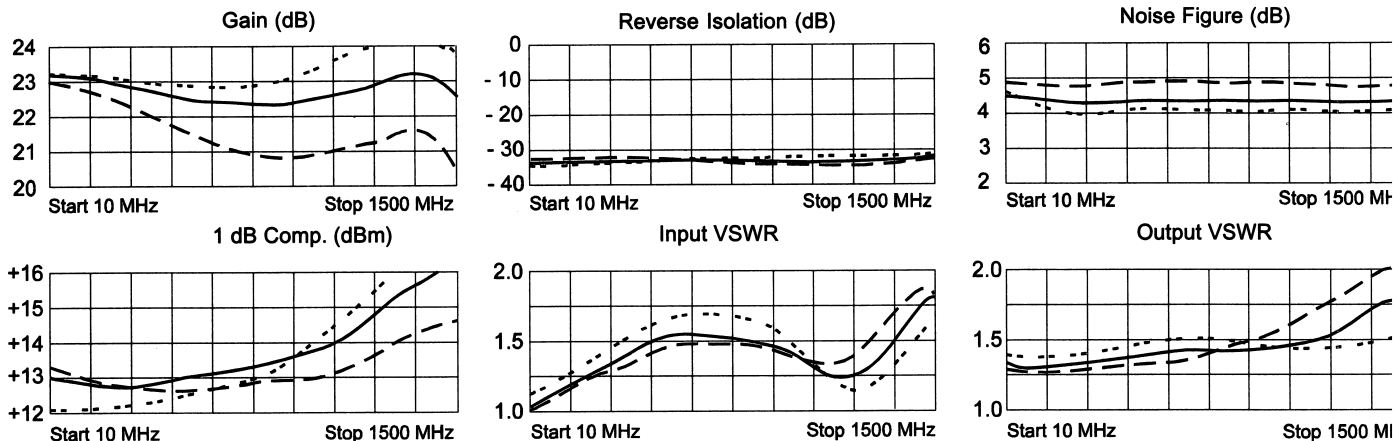
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +37 (Typ)
 Second Order Two Tone Intercept Point +31 (Typ)
 Third Order Two Tone Intercept Point +23 (Typ)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Maximum)
 Maximum Peak Power 0.5 Watt
 3 μsec Maximum

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.01	147	14.76	4	.02	6	.14	162
50	.03	-124	14.70	- 11	.02	2	.13	172
100	.06	-116	14.65	- 24	.02	4	.13	168
300	.15	-145	14.00	- 73	.02	- 6	.15	148
500	.21	-173	13.30	-119	.02	- 4	.17	111
700	.22	159	12.74	-165	.02	- 7	.18	66
900	.19	133	12.57	150	.03	-17	.18	9
1100	.12	117	12.59	102	.02	-26	.21	- 51
1300	.12	149	13.19	48	.02	-29	.28	-113
1500	.24	118	13.03	- 21	.03	-32	.32	166

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RF AMPLIFIER

MODEL TM9566

Available as: TM9566, 4 Pin TO-8 (T4)
 TN9566-3, 4 Pin Surface Mount (SM3)
 FP9566-4, 4Pin Flatpack (FP4)
 BX9566, Connectorized Housing (H1)

Features

- High Gain: 26 dB Typical
- Low Noise Figure: <3dB Typical
- Low 5 Volt Bias

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 1100 MHz	10 - 1000 MHz
Gain (dB)	26	24.5 Min.
Power @ 1 dB Comp. (dBm)	+0.5	-0.5 Min.
Reverse Isolation (dB)	- 35	- 34 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<3.0	4.0 Max.
Power Vdc	+5	+5
mA	18	20 Max.

Note: Care should always be taken to effectively ground the case of each unit.

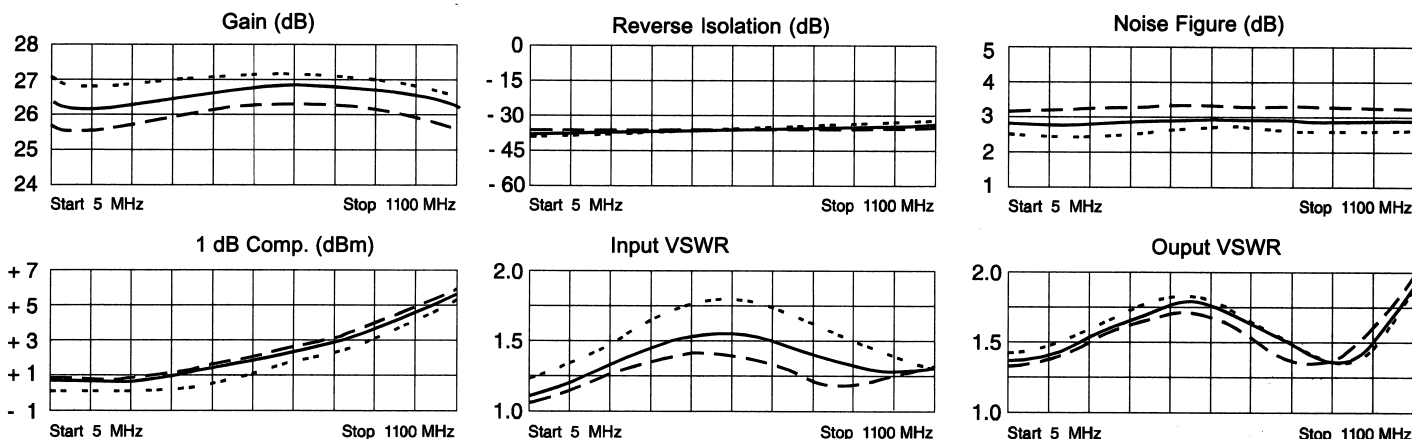
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +26 (Typ.)
 Second Order Two Tone Intercept Point +21 (Typ.)
 Third Order Two Tone Intercept Point +12 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 10 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11 Mag.	S11 Deg.	S21 Mag.	S21 Deg.	S12 Mag.	S12 Deg.	S22 Mag.	S22 Deg.
5	.03	-38	21.05	4	.02	8	.21	-174
10	.04	-30	20.93	-0	.01	-1	.21	-175
50	.04	-67	20.48	-13	.01	3	.21	-176
100	.07	-83	20.67	-26	.01	-11	.22	-176
200	.13	-124	20.92	-52	.01	7	.24	-180
400	.19	-169	21.86	-105	.01	4	.29	-165
600	.20	138	22.11	-162	.02	-1	.28	139
800	.14	62	22.13	139	.02	-1	.17	126
1000	.11	-44	21.70	75	.02	-25	.20	177
1200	.15	-144	18.54	-2	.02	2	.44	143

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RF AMPLIFIER

MODEL TR9604

Available as: RN9604, 4 Pin Surface Mount (SM19)
BR9604, Connectorized Housing (H2)

Features

- High Output Power: +21 dBm Typical
- High Gain: +23 dB Typical

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		10 - 500 MHz	30 - 500 MHz
Gain (dB)		23	21.0 Min.
Power @ 1 dB Comp. (dBm)		+21	+19.0 Min.
Reverse Isolation (dB)		- 32	- 30 Max.
VSWR	In Out	<1.75:1 <1.75:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		5.0	6.0 Max.
Power	Vdc mA	+15 125	+15 140 Max.

Note: Care should always be taken to effectively ground the case of each unit.

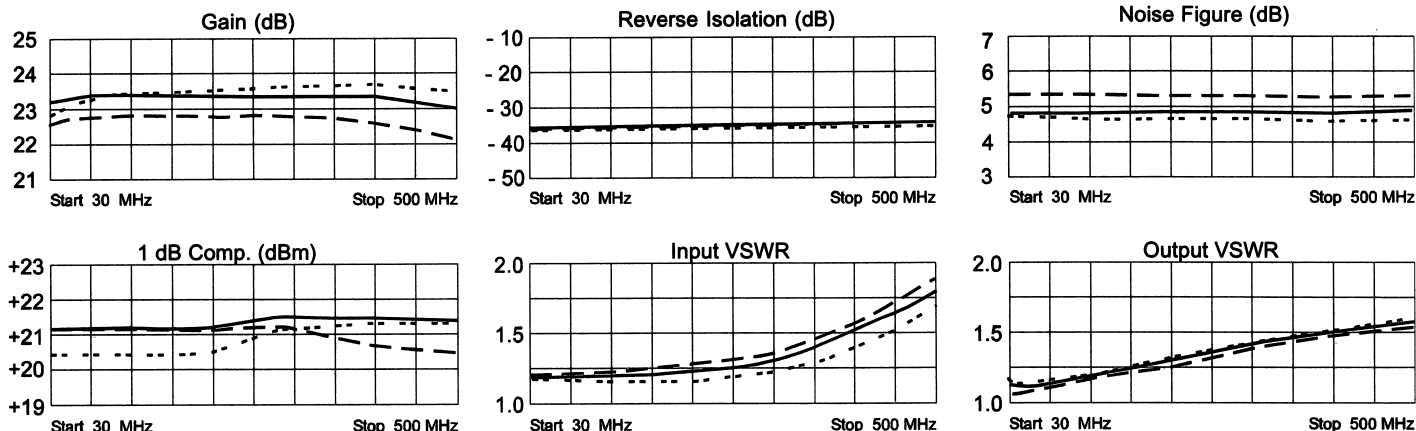
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
Second Order Two Tone Intercept Point +40 (Typ.)
Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.07	-19	13.69	22	.02	2	.09	48
30	.08	-7	14.45	-3	.01	-2	.07	-4
50	.08	-7	14.54	-14	.02	0	.06	-29
100	.08	-10	14.63	-3	.02	2	.09	-63
200	.09	-7	14.72	-79	.02	1	.15	-101
300	.13	-8	14.81	-121	.02	4	.18	-129
400	.20	-22	14.65	-164	.02	6	.21	-149
500	.30	-43	14.06	150	.02	-3	.23	-167

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RF AMPLIFIER MODEL TR9666

Available as: RN9666, 4 Pin Surface Mount (SM19)
BX9666, Connectorized Housing (H2)

Features

- High Gain : 37 dB Typical
- Low Noise Figure: <3.5 dB Typical

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	37	34.0 Min.
Power @ 1 dB Comp. (dBm)	+15.5	+14.0 Min.
Reverse Isolation (dB)	- 52	- 49 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.6:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
Power Vdc	+15	+15
mA	82	87 Max.

Note: Care should always be taken to effectively ground the case of each unit.

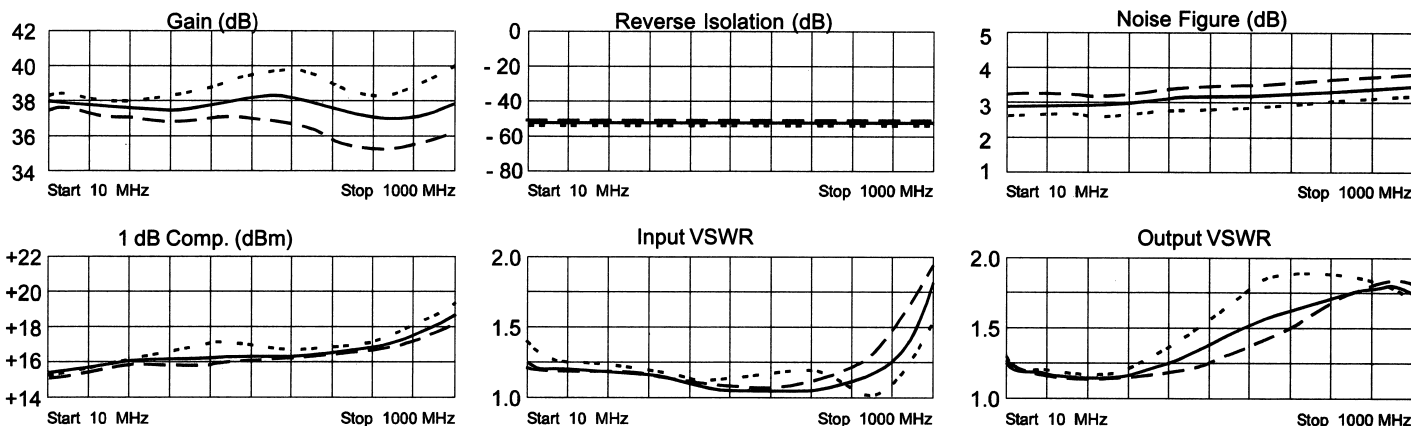
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +37 (Typ.)
Second Order Two Tone Intercept Point +31 (Typ.)
Third Order Two Tone Intercept Point +25 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.12	-169	80.22	-178	.002	- 19	.13	157
50	.10	160	80.76	158	.002	20	.10	164
100	.10	142	79.59	134	.002	- 13	.09	162
200	.09	108	76.91	89	.002	- 12	.07	162
400	.04	55	78.05	2	.002	- 7	.11	150
600	.02	149	83.56	- 95	.002	24	.21	72
800	.02	-146	73.82	166	.002	-134	.25	- 30
1000	.30	-165	80.90	59	.002	172	.22	-121

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RF AMPLIFIER

MODEL *TM9700*

Available as: TM9700, 4 Pin TO-8 (T4)
TN9700, 4 Pin Surface Mount (SM3)
FP9700, 4 Pin Flatpack (FP4)
BX9700, Connectorized Housing (H1)
PN9700, Reduced Size Surface Mount (SM11)

Features

- GaAs FET; Low Noise Figure: 2.5 dB Typical
- High Output Power: +19 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	200 - 2000 MHz	200 - 2000 MHz
Gain (dB)	12	10.5 Min.
Power @ 1 dB Comp. (dBm)	+19	+18 Min.
Reverse Isolation (dB)	- 21	-20.0 Max.
VSWR In	<2.0:1	2.2:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	2.5	4.0 Max.
Power Vdc	+6	+6
mA	65	72 Max.

Note: Care should always be taken to effectively ground the case of each unit.

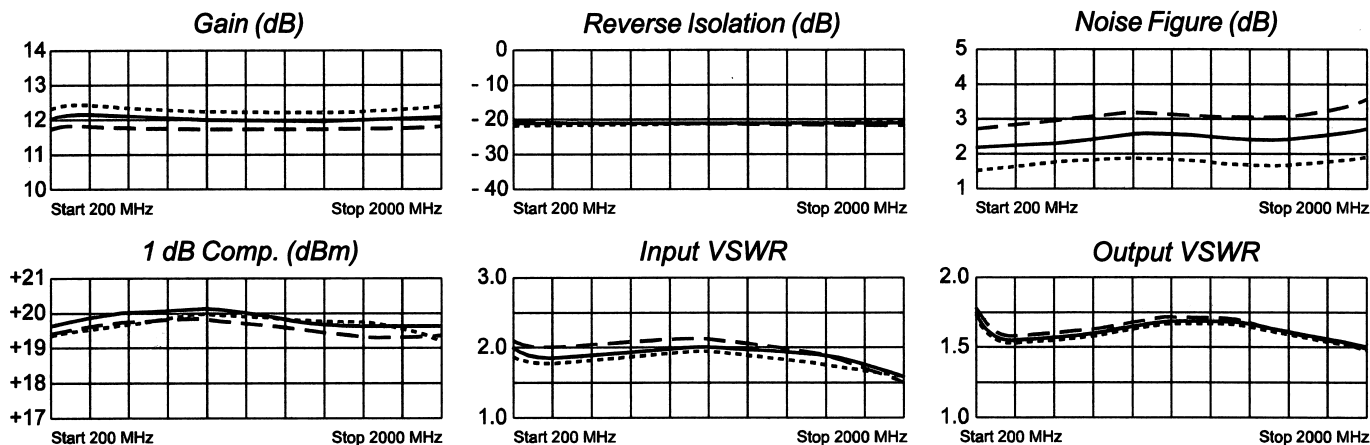
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +49 (Typ.)
Second Order Two Tone Intercept Point +43 (Typ.)
Third Order Two Tone Intercept Point +33 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.1 Watt
..... (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
200	.33	47	3.98	-179	.084	10	.26	83
400	.29	67	4.00	158	.092	- 4	.21	51
600	.29	79	3.90	141	.089	- 13	.22	34
800	.29	95	3.65	125	.088	- 19	.25	16
1000	.28	-112	3.79	111	.088	- 28	.25	- 1
1200	.29	-122	3.70	98	.087	- 37	.25	- 13
1400	.28	-138	3.80	82	.081	- 42	.23	- 34
1600	.27	-150	3.76	68	.079	- 51	.21	- 51
1800	.25	-180	3.76	50	.082	- 56	.18	- 77
2000	.21	-167	3.65	33	.082	- 68	.14	-100

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Rev. A 05/03/01

RF AMPLIFIER

MODEL *TM9701*

Available as: TM9701, 4 Pin TO-8 (T4)
 TN9701-3, 4 Pin Surface Mount (SM)
 FP9701-4, 4 Pin Flatpack (FP4)
 BX9701, Connectorized Housing (H1)
 PN9701, Reduced Size Surface Mount (SM11)

Features

- GaAs FET: Low Noise Figure: 3 dB Typical
- Medium Output Power: +14 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	200 - 2000 MHz	200 - 2000MHz
Gain (dB)	12	11.0 Min.
Power @ 1 dB Comp. (dBm)	+15	+14.0 Min.
Reverse Isolation (dB)	- 18	- 17 Max.
VSWR In	<2.0:1	2.2:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3	4.0 Max.
Power Vdc	+5	+5
mA	48	52 Max.

Note: Care should always be taken to effectively ground the case of each unit.

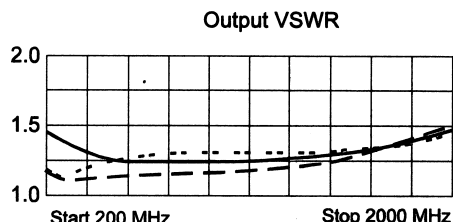
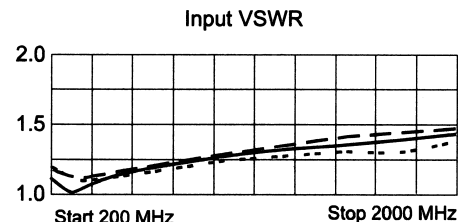
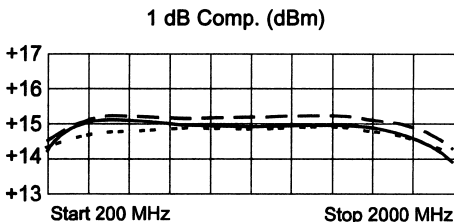
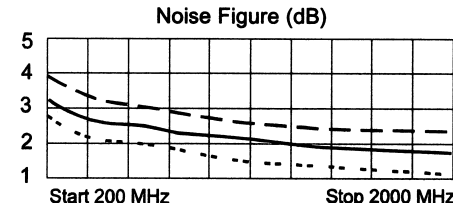
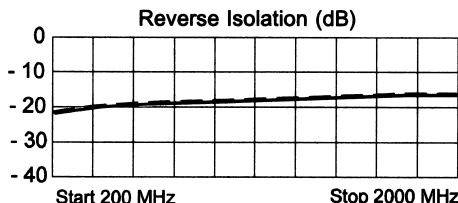
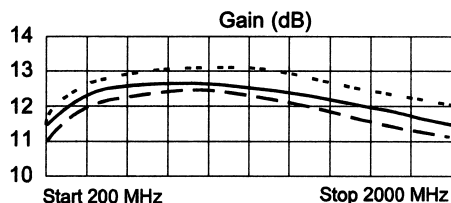
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +48 (Typ.)
 Second Order Two Tone Intercept Point +43 (Typ.)
 Third Order Two Tone Intercept Point +29 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
200	.31	-21	3.90	174	.10	- 6	.05	-153
400	.31	-40	3.88	151	.10	- 16	.08	-138
600	.33	-59	3.8	137	.10	- 24	.12	-146
800	.33	-79	3.79	124	.10	- 33	.12	-156
1000	.33	-97	3.82	109	.10	- 42	.14	-159
1200	.33	-115	3.86	94	.10	- 53	.16	-166
1400	.27	-138	3.84	78	.11	- 58	.19	-179
1600	.26	-164	3.87	61	.11	- 75	.18	-169
1800	.22	146	3.89	41	.11	- 86	.17	156
2000	.24	71	3.73	21	.11	- 97	.16	144

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RF AMPLIFIER

MODEL *TM9702*

Available as: TN9702, 4 Pin Surface Mount (SM3)
BX9702, Connectorized Housing (H1)

Features

- GaAs FET; Medium Gain: 12 dB Typical
- High Output Power: +20dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	500 - 1500 MHz	500 - 1500 MHz
Gain (dB)	12	10.5 Min.
Power @ 1 dB Comp. (dBm)	+20	+19.0 Min.
Reverse Isolation (dB)	- 18	- 16 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.0	4.5 Max.
Power Vdc	+8	+8
mA	105	110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

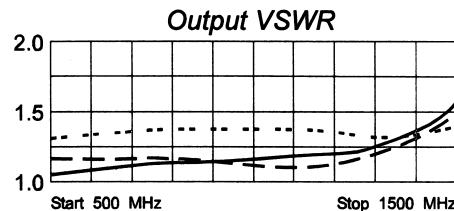
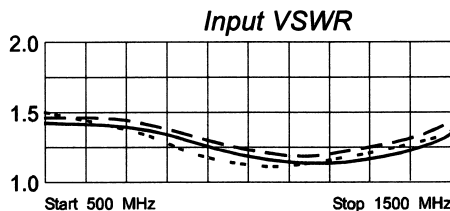
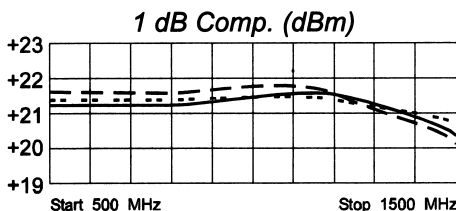
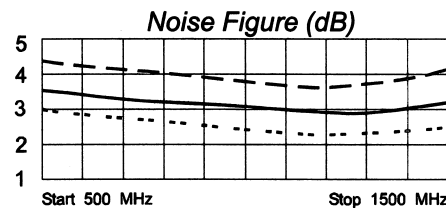
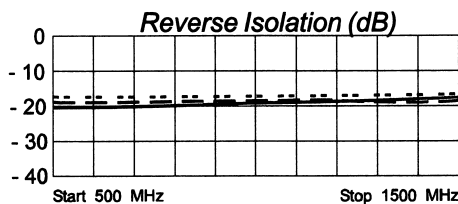
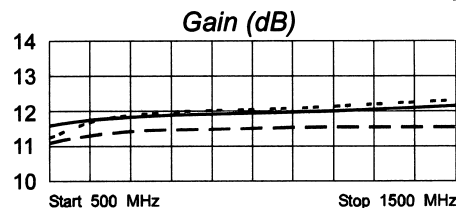
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46 (Typ.)
Second Order Two Tone Intercept Point +40 (Typ.)
Third Order Two Tone Intercept Point +31 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
(1 Minute Max.)
Maximum Peak Power 0.5 Watt
3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C ····· -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
300	.19	- 20	3.61	172	.09	- 1	.07	62
500	.17	- 18	3.74	148	.10	- 18	.02	177
700	.14	- 29	3.97	127	.10	- 34	.07	170
900	.08	43	3.99	106	.10	- 48	.10	139
1100	.02	-174	3.97	94	.11	- 68	.10	104
1300	.11	132	3.79	61	.11	- 97	.07	53
1500	.23	121	3.63	38	.11	-108	.09	- 46

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RF AMPLIFIER

MODEL *TM9705*

Available as: TM9705, 4 Pin TO-8 (T4)
 TN9705, 4 Pin Surface Mount (SM3)
 WP9705, 4 Pin Gullwing (SG -15)
 BX9705, Connectorized Housing (H1)
 PN9705, Reduced Size Surface Mount (SM11)

Features

- GaAs FET; Low Noise Figure: 1.5 dB Typical
- High Output Power: 23 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	225 - 400 MHz	225 - 400 MHz
Gain (dB)	15.0	14 Min/ 16 Max
Power @ 1 dB Comp. (dBm)	+23.0	+22.0 Min.
Reverse Isolation (dB)	-21.0	Max.
VSWR In	1.7:1	2.0:1 Max.
VSWR Out	1.7:1	2.0:1 Max.
Noise figure (dB)	1.5	2.0 Max.
Power Vdc mA	+15 90	+15 100 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 ° C

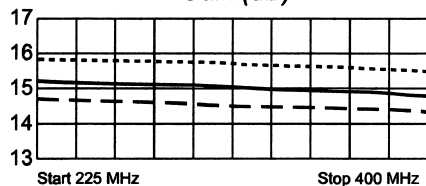
Second Order Harmonic Intercept Point +49 (Typ.)
 Second Order Two Tone Intercept Point +44 (Typ.)
 Third Order Two Tone Intercept Point +34 (Typ.)

Maximum Ratings

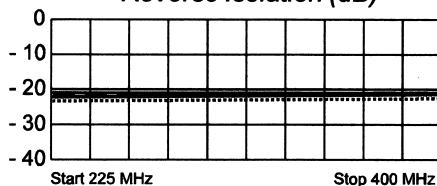
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 95 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 15 dBm
 Short Term RF Input Power 100 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.2 Watt
 (3 µsec Max.)

Typical Performance Data

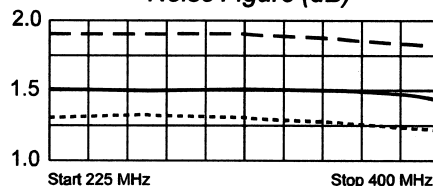
Gain (dB)



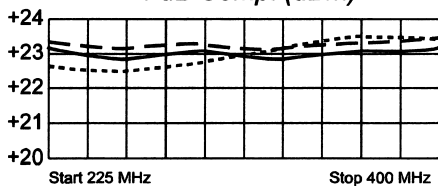
Reverse Isolation (dB)



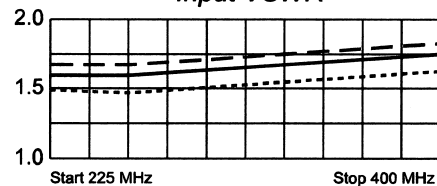
Noise Figure (dB)



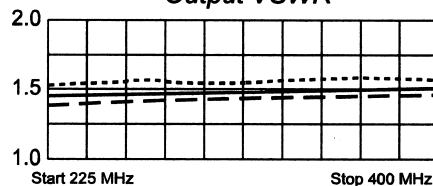
1 dB Comp. (dBm)



Input VSWR



Output VSWR



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	---- S11 ----		---- S21 ----		---- S12 ----		---- S22 ----	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
225	.22	-11	5.75	165	.0819	8	.17	-159
260	.22	-28	5.71	160	.0825	6	.17	-163
295	.22	-43	5.66	155	.0832	4	.17	-166
300	.22	-57	5.61	151	.0837	2	.17	-168
400	.23	-80	5.45	142	.0852	- 1	.18	-173

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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Rev. B 05/31/02

RF AMPLIFIER

MODEL *TM9709*

Available as: TM9709, 4 Pin TO-8 (T4)
 TN9709, 4 Pin Surface Mount (SM3)
 FP9709, 4 Pin Flatpack (FP4)
 BX9709, Connectorized Housing (H1)
 PN9709, Reduced Size Surface Mount (SM11)

Features

- High Output Power: >+27 dBm Typical
- High Third Order Intercept: +39 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Gain (dB)	10.5	8.5 Min.
Power @ 1 dB Comp. (dBm)	>+27	+26 Min.
Reverse Isolation (dB)	- 18	-17.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0* Max.
Power Vdc	+15	+15
mA	180	190 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

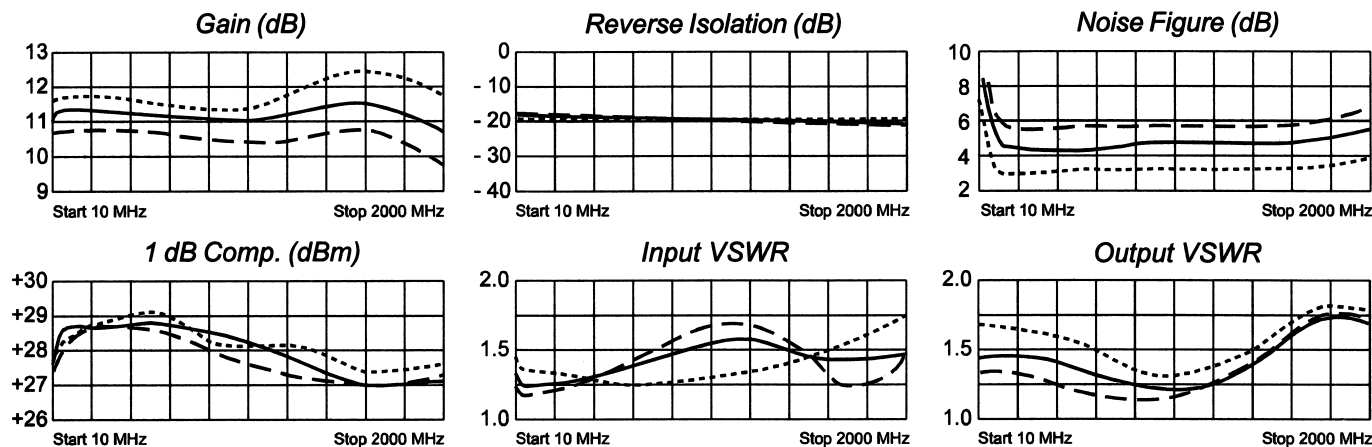
Second Order Harmonic Intercept Point +54 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

* Noise Figure is > 6.0 dB below 100 MHz

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters		----- S11 -----		----- S21 -----		----- S12 -----		----- S22 -----	
FREQ.		Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
MHz									
10		.13	-118	3.46	-170	.128	8	.17	163
100		.09	-168	3.53	171	.127	- 4	.15	166
200		.08	-168	3.51	161	.126	- 9	.15	156
400		.08	-149	3.45	142	.128	- 20	.12	134
600		.09	-123	3.37	122	.122	- 32	.09	117
800		.17	-122	3.18	105	.112	- 40	.09	103
1000		.18	-134	3.24	89	.113	- 49	.09	60
1200		.18	-136	3.35	70	.111	- 59	.09	12
1400		.19	-134	3.43	49	.111	- 71	.11	- 28
1600		.19	-142	3.39	25	.101	- 89	.14	- 66
1800		.14	-136	3.37	1	.102	-100	.18	- 81
2000		.05	- 78	3.09	- 26	.086	-116	.21	-110

Amplifonix

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05/09/01

RF AMPLIFIER

MODEL *TM9712*

Available as: TM9712, 4 Pin TO-8 (T4)
TN9712, 4 Pin Surface Mount (SM3)
FP9712, 4 Pin Flatpack (FP4)
BX9712, Connectrized Housing (H1)
PN9712, Reduced Size Surface Mount (SM11)

Features

- GaAs FET Amplifier
- Low Noise Figure: 3 dB Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	500 - 2000 MHz	500 - 2000 MHz
Gain (dB)	11.5	10.0 Min.
Power @ 1 dB Comp. (dBm)	+16	+15 Min.
Reverse Isolation (dB)	- 18	-17.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<3.5	4.5 Max.
VSWR Vdc	+15	+15
mA	45	50 Max.

Note: Care should always be taken to effectively ground the case of each unit.

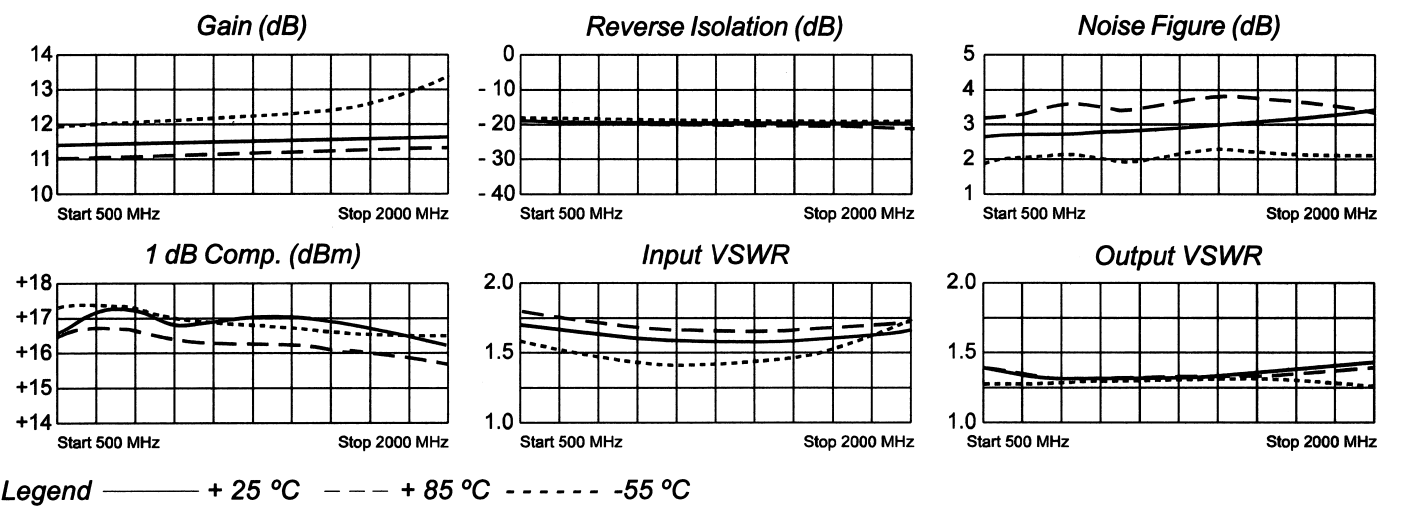
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +40 (Typ.)
Second Order Two Tone Intercept Point +35 (Typ.)
Third Order Two Tone Intercept Point +26 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13 dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



Linear S-Parameters

FREQ. MHz	---- S11 ---- Mag. Deg.	---- S21 ---- Mag. Deg.	---- S12 ---- Mag. Deg.	---- S22 ---- Mag. Deg.
500	.25 - 61	3.80 158	.116 - 12	.15 54
600	.25 - 70	3.79 151	.115 - 17	.14 46
800	.24 - 87	3.80 137	.115 - 26	.14 35
1000	.23 -106	3.79 124	.111 - 35	.13 25
1200	.22 -126	3.81 111	.112 - 42	.13 14
1400	.22 -145	3.82 98	.108 - 50	.14 7
1600	.23 -167	3.83 84	.104 - 61	.14 - 2
1800	.23 172	3.86 70	.106 -71	.15 -13
2000	.25 151	3.88 55	.103 -83	.17 -25



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RF AMPLIFIER

MODEL *TM9713*

Available as: TM9713, 4 Pin TO-8 (T4)
 TN9713, 4 Pin Surface Mount (SM3)
 FP9713, 4 Pin Flatpack (FP4)
 BX9713, Connectrized Housing (H1)
 PN9713, Reduced Size Surface Mount (SM11)

Features

- GaAs FET Amplifier
- High Output Power: +21 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		500 - 2000 MHz	500 - 2000 MHz
Gain (dB)		11	8.5 Min.
Power @ 1 dB Comp. (dBm)		+21	+19.0 Min.
Reverse Isolation (dB)		- 17.5	- 16 Max.
VSWR	In Out	1.8:1 1.8:1	2.0:1 Max. 2.0:1 Max.
Noise figure (dB)		4.5	5.5 Max.
Power	Vdc mA	+15 100	+15 110 Max.

Note: Care should always be taken to effectively ground the case of each unit.

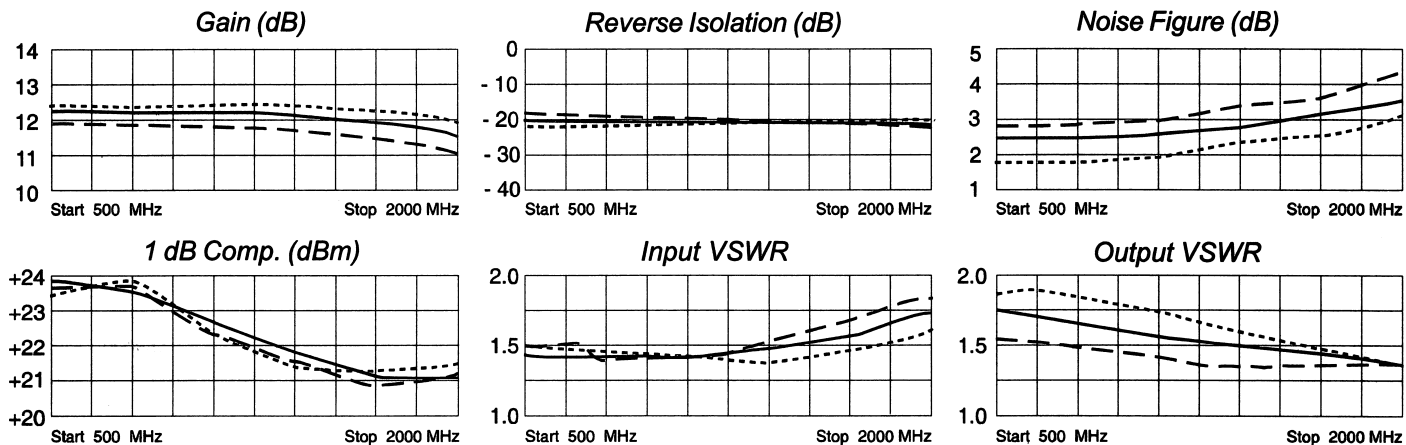
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +50(Typ.)
 Second Order Two Tone Intercept Point +44(Typ.)
 Third Order Two Tone Intercept Point +34(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C
 Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
500	.18	169	3.88	144	.1070	-23	.29	128
600	.17	159	3.87	134	.1071	-28	.28	119
800	.16	140	3.88	116	.1065	-39	.27	99
1000	.16	124	3.88	98	.1049	-51	.25	77
1200	.14	112	3.87	79	.1040	-63	.23	54
1400	.14	104	3.92	60	.1010	-76	.21	29
1600	.14	103	3.89	40	.0976	-91	.18	-2
1800	.16	98	3.76	17	.0915	-107	.16	-38
2000	.18	89	3.66	-7	.0885	-123	.17	-80

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RF AMPLIFIER

MODEL *TM9715*

Available as: TN9715, 4 Pin Surface Mount (SM3)
BX9715, Connectorized Housing (H1)

Features

- GaAs FET Design; Medium Gain: 11 dB Typical
- High Output Power: +26 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	500 - 2000 MHz	500 - 2000 MHz
Gain (dB)	11	10.0 Min.
Power @ 1 dB Comp. (dBm)	+25	+24.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<2.0:1	2.3:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.0 Max.
Power Vdc	+12	+12
mA	180	220 Max.

Note: Care should always be taken to effectively ground the case of each unit.

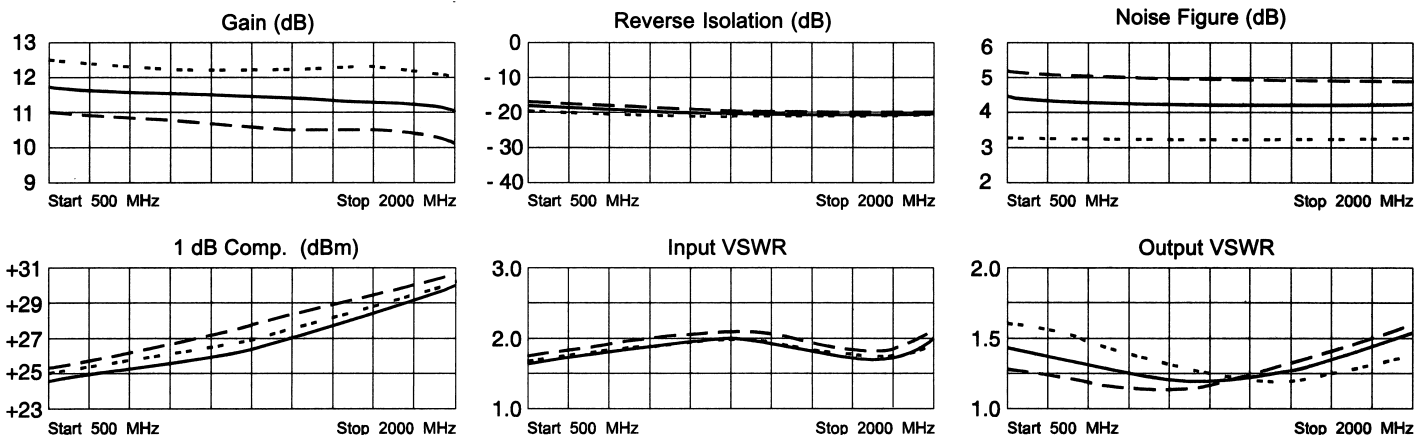
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +55 (Typ.)
Second Order Two Tone Intercept Point +49 (Typ.)
Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... 3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
500	.26	-148	3.88	141	.11	- 26	.17	134
750	.31	-165	3.80	118	.10	- 38	.13	104
1000	.34	177	3.76	97	.10	- 48	.09	69
1250	.34	154	3.72	73	.10	- 57	.08	- 4
1500	.31	123	3.64	49	.10	- 67	.08	- 73
1750	.27	72	3.56	22	.10	- 80	.13	-110
2000	.34	5	3.36	- 8	.10	-100	.18	-129

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RF AMPLIFIER

MODEL *TM9723*

Available as: TM9723, 4 Pin TO-8 (T4)
 TN9723, 4 Pin Surface Mount (SM3)
 FP9723, 4 Pin Flatpack (FP4)
 BX9723, Connectorized Housing (H1)
 PN9723, Reduced Size Surface Mount (SM11)

Features

- GaAs FET Amplifier; Medium Gain: 13 dB Typ.
- High Output Power: > +27 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Gain (dB)	13	12.0 Min.
Power @ 1 dB Comp. (dBm)	>+27	+26.0 Min.
Reverse Isolation (dB)	- 18	-17.0 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	8.0* Max.
Power Vdc	+15	+15
mA	185	195 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

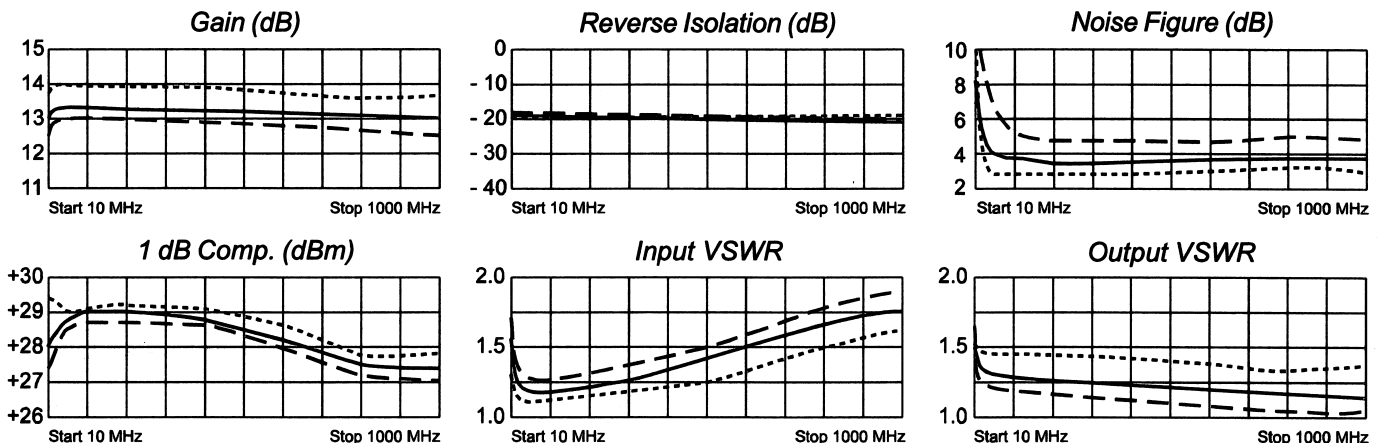
Second Order Harmonic Intercept Point +52 (Typ.)
 Second Order Two Tone Intercept Point +48 (Typ.)
 Third Order Two Tone Intercept Point +40 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17Volts
 Continuous RF Input Power + 18 dBm
 Short Term RF Input Power 150 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.3 Watt
 (3 µsec Max.)

* Noise Figure is > 8.0 dB below 30 MHz

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
10	.21	- 57	4.51	-161	.106	11	.20	139
50	.09	- 41	4.69	179	.108	0	.13	166
100	.08	- 42	4.69	172	.109	- 2	.12	164
200	.10	- 56	4.70	161	.110	- 8	.11	159
400	.13	- 80	4.65	140	.108	-17	.09	147
600	.19	-100	4.56	120	.104	-27	.08	135
800	.23	-121	4.48	101	.100	-35	.07	115
1000	.29	-139	4.47	83	.097	-34	.04	79

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RF AMPLIFIER

MODEL *TM9725*

Available as: TM9725, 4 Pin TO-8
 TN9725-3, 4 Pin Surface Mount (SM3)
 FP9725-4, 4Pin Flatpack (FP4)
 BX9725, Connectorized Housing (H1)

Features

- Medium Gain: 11 dB Typical
- High Output Power: +26.5 dBm Typical
- High IP_3 : +38 dBm Typical

Specifications

CHARACTERISTIC	TYPICAL $T_a = 25^\circ\text{C}$	MIN/MAX $T_a = -55^\circ\text{C to } +85^\circ\text{C}$
Frequency	500 - 2000 MHz	500 - 2000 MHz
Gain (dB)	11	10.0 Min.
Power @ 1 dB Comp. (dBm)	+26.5	+25.0 Min.
Reverse Isolation (dB)	- 19	- 18 Max.
VSWR In	<1.5:1	2.0:1 Max.
VSWR Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	3.75	6.0 Max.
Power Vdc	+15	+15
mA	165	190 Max.

Note: Care should always be taken to effectively ground the case of each unit.

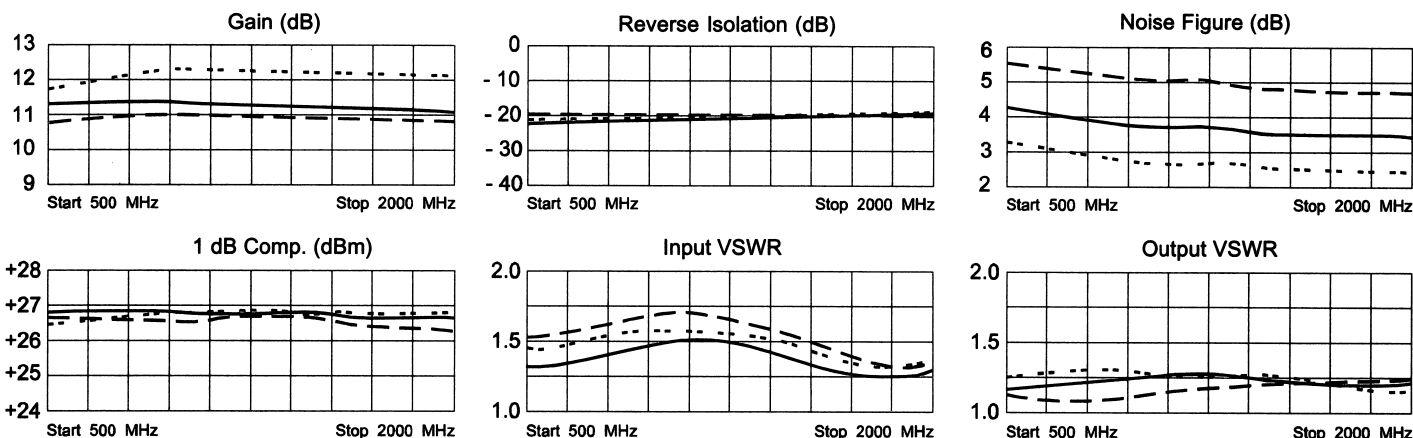
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +51(Typ.)
 Second Order Two Tone Intercept Point +45(Typ.)
 Third Order Two Tone Intercept Point +38(Typ.)

Maximum Ratings

Ambient Operating Temperature $-55^\circ\text{C to } +100^\circ\text{C}$
 Storage Temperature $-62^\circ\text{C to } +125^\circ\text{C}$
 Case Temperature $+125^\circ\text{C}$
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 3 μsec Max.)

Typical Performance Data



Legend ——— + 25 °C --- + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
500	.20	- 76	3.73	153	.11	- 5	.05	108
750	.24	-100	3.77	131	.10	-13	.08	80
1000	.25	-126	3.71	110	.10	-19	.10	48
1250	.24	-152	3.62	90	.10	-23	.11	20
1500	.21	-179	3.52	70	.10	-26	.12	- 12
1750	.17	-139	3.41	49	.11	-32	.11	- 44
2000	.14	79	3.26	28	.12	-39	.13	- 82

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RF AMPLIFIER MODEL TR9737

Available as: TR9737, 4 Pin TO-8 (T4)
FP9737-4, 4 Pin Flatpack (FP4)
BR9737, Connectrized Housing (H2)

Features

- GaAs FET Low Noise Figure: <4.5 dB Typical
- High Output Power: +24 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	100 - 2000 MHz	200 - 2000 MHz
Gain (dB)	9.5	8.0 Min.
Power @ 1 dB Comp. (dBm)	+24	+22.0 Min.
Reverse Isolation (dB)	- 14	- 13 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.75:1	2.0:1 Max.
Noise figure (dB)	<4.5	6.5 Max.
VSWR Vdc	+15	+15 Max.
mA	140	160 Max.

Note: Care should always be taken to effectively ground the case of each unit.

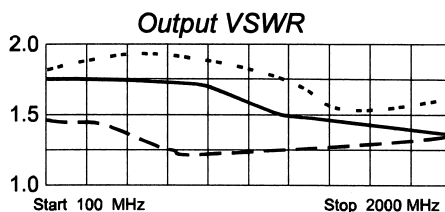
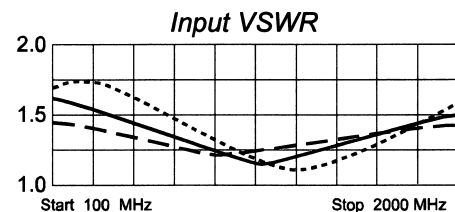
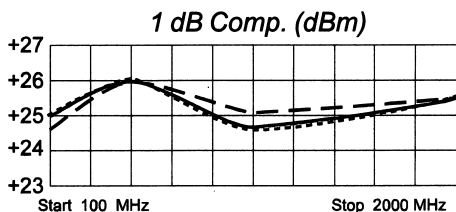
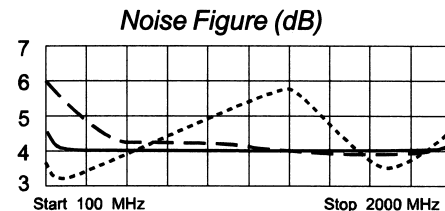
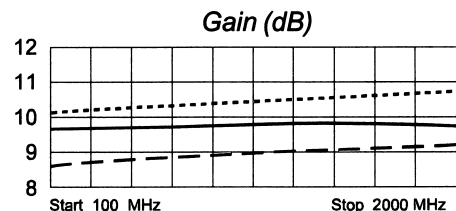
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +54(Typ.)
Second Order Two Tone Intercept Point +49(Typ.)
Third Order Two Tone Intercept Point +38(Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 18 dBm
Short Term RF Input Power 100 Milliwatts
(1 Minute Max.)
Maximum Peak Power.....0.5 Watt
(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22	
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
100	.24	179	2.97	171	.13	- 3	.26	163
200	.24	171	2.95	161	.13	- 7	.26	147
500	.20	154	2.93	132	.14	- 18	.24	101
1000	.08	133	3.01	84	.15	- 41	.24	24
1500	.09	-140	3.11	29	.16	- 69	.22	- 54
2000	.15	177	3.00	-34	.16	-106	.24	- 127

Amplifonix

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RF AMPLIFIER

MODEL *TM9738*

Available as: TM9738, 4 Pin TO-8 (T4)
TN9738, 4 Pin Surface Mount (SM3)
FP9738, 4 Pin Flatpack (FP4)
BX9738, Connectorized Housing (H1)
PN9738, Reduced Size Surface Mount (SM11)

Features

- High Out put Power: +25 dBm Typical
- High Third Order Intercept: +39 dBm Typical
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	200 - 2000 MHz	200 - 2000 MHz
Gain (dB)	11	9 Min.
Power @ 1 dB Comp. (dBm)	+25.5	+24.0 Min.
Reverse Isolation (dB)	- 19	-17.0 Max.
VSWR In	<1.5:1	2.0:1 Max.
Out	<1.5:1	2.0:1 Max.
Noise figure (dB)	<4.0	5.2 Max.
Power Vdc	+15	+15
mA	140	160 Max.

Note: Care should always be taken to effectively ground the case of each unit.

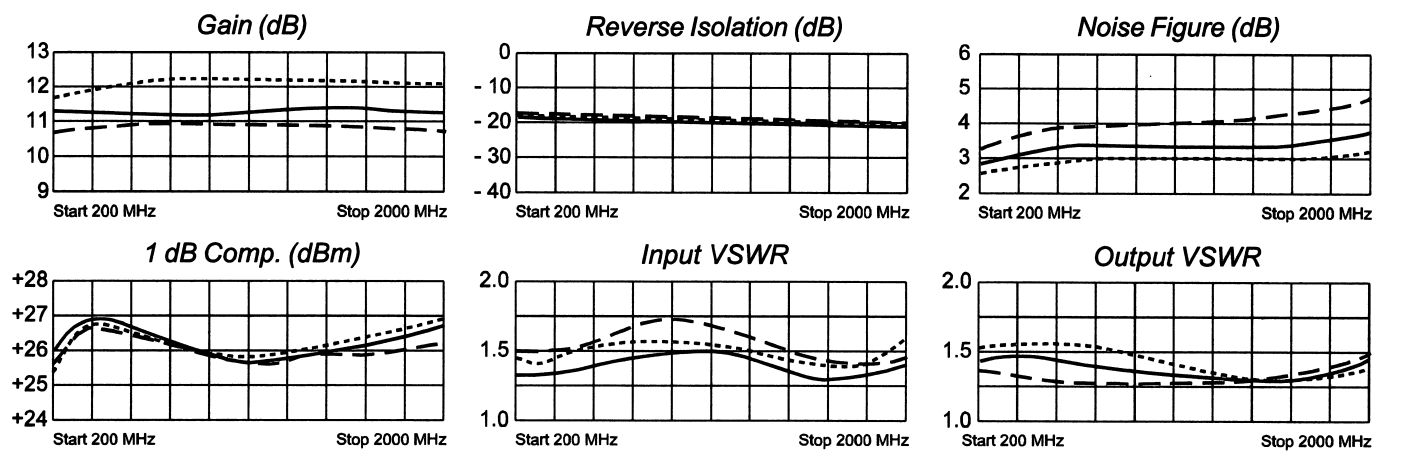
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +52 (Typ.)
Second Order Two Tone Intercept Point +46 (Typ.)
Third Order Two Tone Intercept Point +39 (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.5 Watt
..... (3 µsec Max.)

Typical Performance Data



RF AMPLIFIER

MODEL TR9755

Available as: TR9755, 4 Pin TO-8B (T8)
 TR9755-9, 12 Pin TO-8B (T9)
 RN9755, 4 Pin Surface Mount (SM19)
 BR9755, Connectorized Housing (H2)

Features

- Low Noise Figure: 1dB Typical
- Low 5 Volts Operation
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	800-1200 MHz	800-1200 MHz
Gain (dB)	26	24 Min.
Power @ 1 dB Comp. (dBm)	+14	+13 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	1.0	1.75 Max.
Power Vdc	+5	+5
mA	62	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

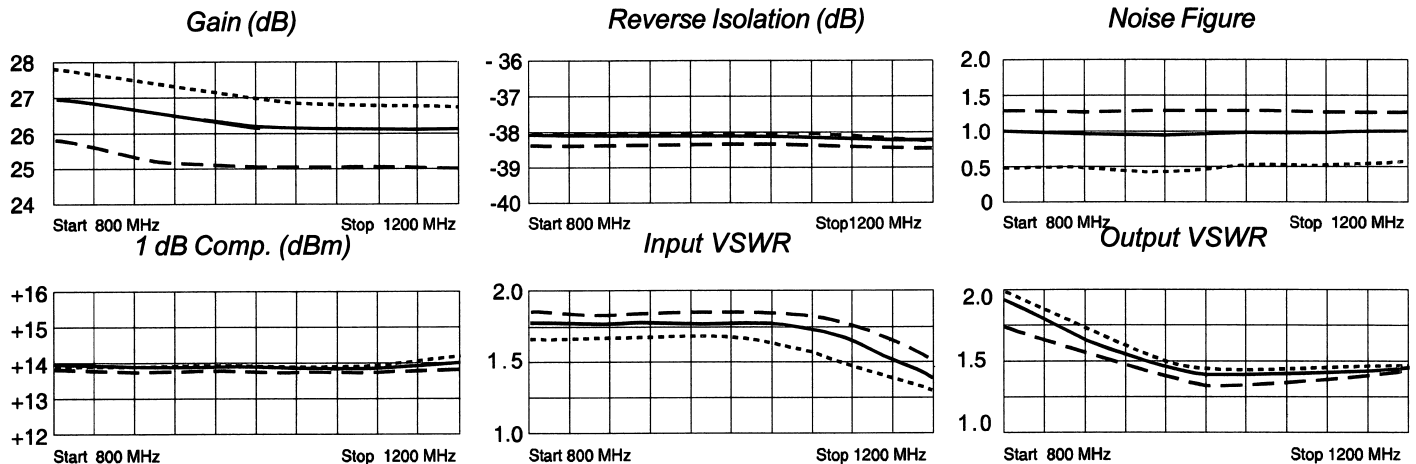
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point +46dBm (Typ.)
 Second Order Two Tone Intercept Point +40dBm (Typ.)
 Third Order Two Tone Intercept Point +25dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature.....-55°C to + 100 °C
 Storage Temperature.....-62°C to + 125 °C
 Case Temperature.....+ 125 °C
 DC Voltage.....+ 8 Volts
 Continuous RF Input Power.....+ 13 dBm
 Short Term RF Input Power....200 Milliwatts(1 Minute Max.)
 Maximum Peak Power..... 0.5(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22		K	Del
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg		
800	.18	-116	22.80	-128	.0099	32	.23	37	2.10	.19
900	.19	-167	21.58	-158	.0107	14	.19	15	2.10	.20
1000	.15	159	20.93	173	.0104	-9	.17	-9	2.26	.19
1100	.07	111	20.39	147	.0105	-30	.17	-36	2.35	.20
1200	.10	-11	20.39	118	.0102	-53	.18	-67	2.42	.22

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

RF AMPLIFIER

MODEL TR9756

Available as: TR9756, 4 Pin TO-8B (T8)
 TR9756-9, 12 Pin TO-8B (T9)
 RN9756, 4 Pin Surface Mount (SM19)
 BR9756, Connectorized Housing (H2)

Features

- Low Noise Figure: < 1 dB Typical
- Low 5 Volt Operation
- Unconditionally Stable
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (mHz)	1200 - 1700 MHz	1200 - 1700 MHz
Gain (dB)	27	25.0 Min.
Power @ 1 dB Comp. (dBm)	+15	+14 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	<1.0	1.75 Max.
Power Vdc	+5	+5
mA	60	63 Max.

Note: Care should always be taken to effectively ground the case of each unit.

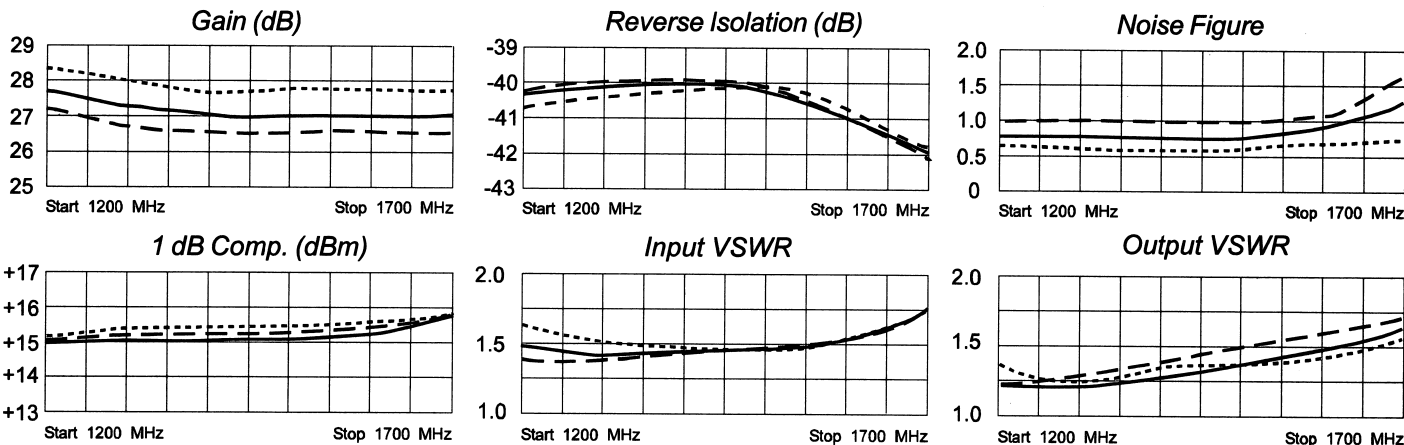
Typical Intermodulation Performance at 25 ° C

Second Order Harmonic Intercept Point.....+46 dBm (Typ.)
 Second Order Two Tone Intercept Point.....+40 dBm (Typ.)
 Third Order Two Tone Intercept Point.....+26 dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature-55°C to + 100 °C
 Storage Temperature-62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 8 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 50 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ MHz	Mag	S11 Deg	Mag	S21 Deg	Mag	S12 Deg	Mag	S22 Deg	K	Del
1200	.06	121	24.08	-157	.0099	116	.01	-42	2.22	.24
1300	.11	166	22.94	176	.0103	101	.02	-99	2.20	.24
1400	.14	163	21.96	152	.0115	82	.03	-130	2.07	.26
1500	.13	152	21.77	126	.0113	53	.04	-153	2.12	.25
1600	.07	108	21.35	99	.0097	39	.05	-170	2.51	.21
1700	.15	-25	21.35	69	.0071	10	.06	170	3.29	.15

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RF AMPLIFIER

MODEL TR9757

Available as: TR9757, 4 Pin TO-8B (T8)
 TR9757-9, 12 Pin TO-8B (T9)
 RN9757, 4 Pin Surface Mount (SM19)
 BR9757, Connectorized Housing (H2)

Features

- Low Noise Figure: 1.5 dB Typical
- Low 5 Volt Operation
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	1700-2400MHz	1700-2400MHz
Gain (dB)	23	22 Min.
Power @ 1 dB Comp. (dBm)	+15	+14 Min.
Reverse Isolation (dB)	-33	-32 Max.
VSWR In	1.5:1	2.0:1 Max.
Out	1.5:1	2.0:1 Max.
Noise figure (dB)	1.5	2.2 Max.
Power Vdc	+5	+5
mA	60	64 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point.....+46dBm (Typ.)

Second Order Two Tone Intercept Point.....+40dBm (Typ.)

Third Order Two Tone Intercept Point.....+26dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage +8Volts

Continuous RF Input Power + 13 dBm

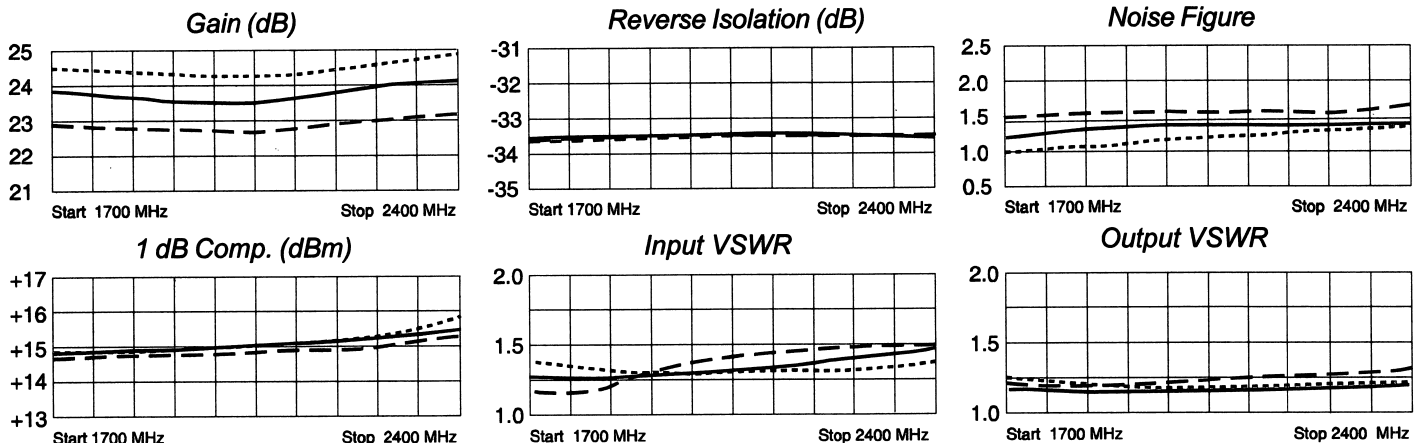
Short Term RF Input Power 200 Milliwatts

(1 Minute Max.)

Maximum Peak Power.....0.5 Watts

(3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22		K	Del
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg		
1700	.20	-85	15.72	126	.0155	8	.24	-20	2.00	.27
1800	.20	-81	15.00	112	.0182	-20	.19	-29	1.87	.31
1900	.19	-78	15.04	98	.0206	-5	.16	-42	1.69	.34
2000	.20	-74	14.80	84	.0160	-20	.13	-51	2.13	.26
2100	.19	-69	14.79	69	.0177	-30	.10	-59	1.97	.28
2200	.19	-62	15.12	55	.0214	-38	.07	-62	1.66	.33
2300	.19	-50	15.50	38	.0203	-38	.06	-63	1.68	.32
2400	.24	-38	15.60	20	.0229	-36	.04	-58	1.50	.36

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RF AMPLIFIER

MODEL TR9770

Available as: TR9770, 4 Pin TO-8B (T8)
 TR9770-9, 12 Pin TO-8B (T9)
 RN9770, 4 Pin Surface Mount (SM19)
 BR9770, Connectorized Housing (H2)

Features

- Low Noise Figure: 1dB Typical
- Unconditionally Stable
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	800-1200 MHz	800-1200 MHz
Gain (dB)	25	24 Min.
Power @ 1 dB Comp. (dBm)	+14	+13 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	1.0	1.75 Max.
Power Vdc	+15	+15
mA	62	65 Max.

Note: Care should always be taken to effectively ground the case of each unit.

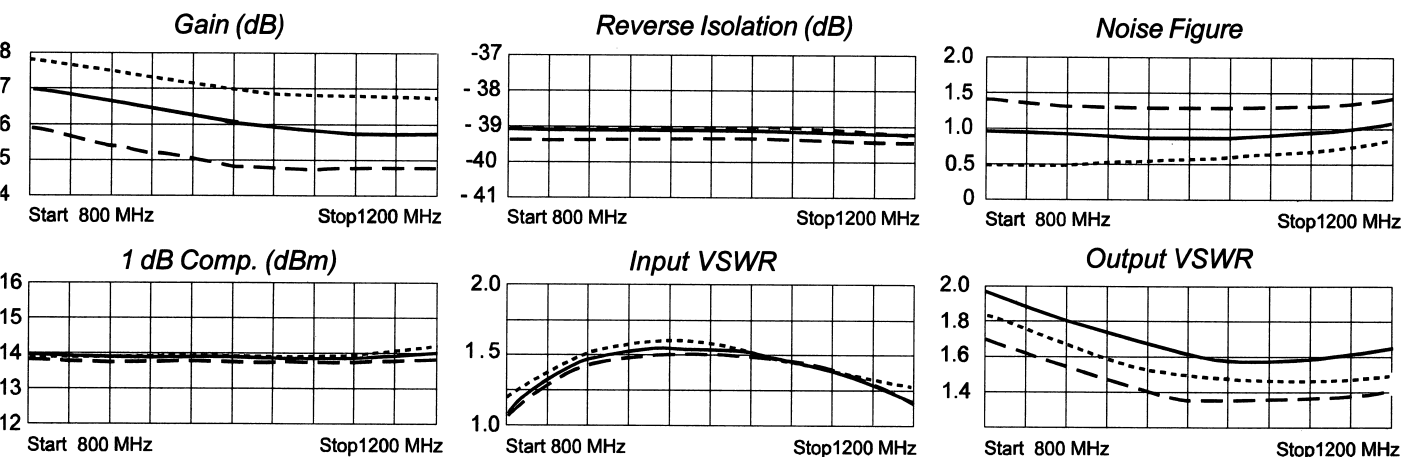
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point +46dBm (Typ.)
 Second Order Two Tone Intercept Point +40dBm (Typ.)
 Third Order Two Tone Intercept Point +25dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature.....-55°C to + 100 °C
 Storage Temperature.....-62°C to + 125 °C
 Case Temperature.....+ 125 °C
 DC Voltage.....+ 18 Volts
 Continuous RF Input Power.....+ 13 dBm
 Short Term RF Input Power..... 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power..... 0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22		K	Del
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg		
800	.21	157	21.01	-128	.0100	27	.26	29	2.21	.20
900	.30	139	19.59	-160	.0104	11	.20	13	2.22	.18
1000	.29	115	18.96	171	.0093	-19	.16	1	2.58	.14
1100	.25	82	18.61	143	.0111	-42	.14	-14	2.30	.18
1200	.23	30	18.79	113	.0110	-66	.11	-38	2.36	.19

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04/23/03

RF AMPLIFIER

MODEL TR9771

Available as: TR9771, 4 Pin TO-8B (T8)
 TR9771-9, 12 Pin TO-8B (T9)
 RN9771, 4 Pin Surface Mount (SM19)
 BR9771, Connectorized Housing (H2)

Features

- Low Noise Figure: <1dB Typical
- Unconditionally Stable
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	1200-1700MHz	1200-1700MHz
Gain (dB)	27	25 Min.
Power @ 1 dB Comp. (dBm)	+15	+14 Min.
Reverse Isolation (dB)	- 38	- 36 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	<1.0	1.75 Max.
Power Vdc	+15	+15 Max.
mA	60	63 Max.

Note: Care should always be taken to effectively ground the case of each unit.

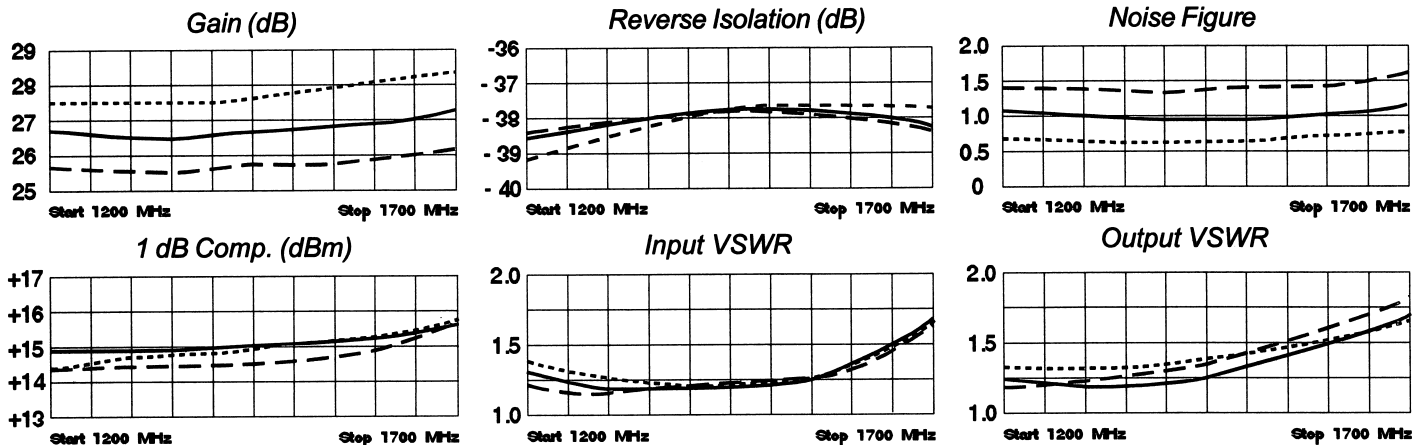
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point..... +46dBm (Typ.)
 Second Order Two Tone Intercept Point.....+40dBm (Typ.)
 Third Order Two Tone Intercept Point..... +26dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power.....0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22		K	Del
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg		
1200	.21	57	24.56	-163	.0109	118	.03	-4	1.93	.27
1300	.15	52	23.86	171	.0128	96	.03	-37	1.76	.31
1400	.10	51	22.90	146	.0172	79	.04	-69	1.45	.40
1500	.08	36	23.13	121	.0170	54	.05	-101	1.46	.40
1600	.10	11	22.89	93	.0174	32	.06	-128	1.44	.40
1700	.22	-28	22.82	61	.0147	-5	.06	-164	1.58	.34

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04/18/03

RF AMPLIFIER

MODEL TR9772

Available as: TR9772, 4 Pin TO-8B (T8)
 TR9772-9, 12 Pin TO-8B (T9)
 RN9772, 4 Pin Surface Mount (SM19)
 BR9772, Connectorized Housing (H2)

Features

- Low Noise Figure: 1.5 dB Typical
- Unconditionally Stable
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	1700-2400MHz	1700-2400MHz
Gain (dB)	23	22 Min.
Power @ 1 dB Comp. (dBm)	+15	+14 Min.
Reverse Isolation (dB)	-35	-33 Max.
VSWR In	1.8:1	2.0:1 Max.
Out	1.8:1	2.0:1 Max.
Noise figure (dB)	1.5	2.2 Max.
Power Vdc	+15	+15
mA	65	70 Max.

Note: Care should always be taken to effectively ground the case of each unit.

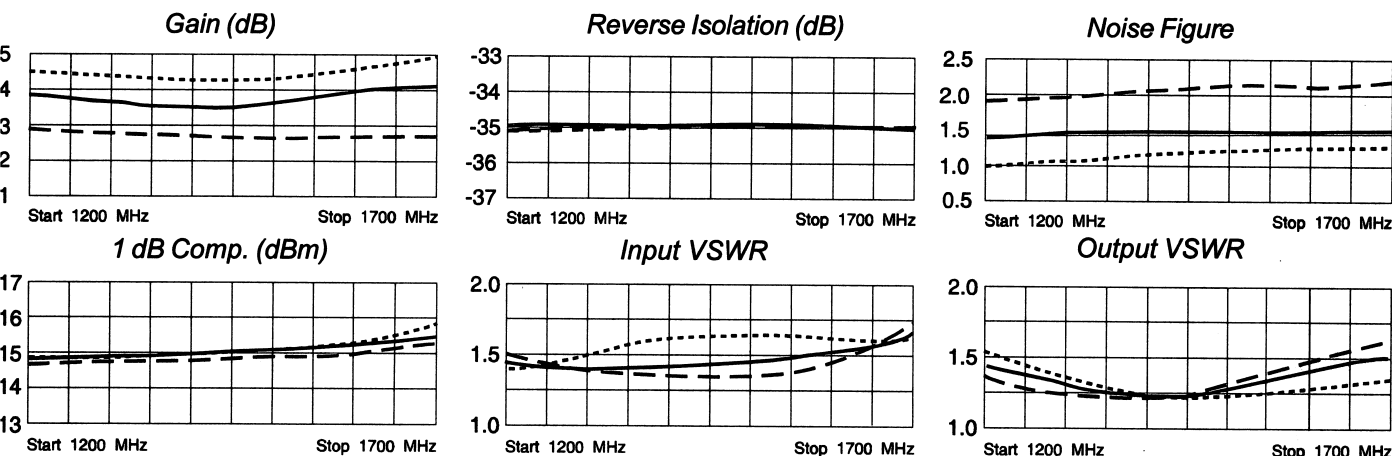
Typical Intermodulation Performance at 25 °C

Second Order Harmonic Intercept Point..... +46dBm (Typ.)
 Second Order Two Tone Intercept Point.....+40dBm (Typ.)
 Third Order Two Tone Intercept Point.....+26dBm (Typ.)

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +18Volts
 Continuous RF Input Power + 13 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power.....0.5 Watt
 (3 µsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C

Linear S-Parameters

FREQ. MHz	S11		S21		S12		S22		K	Del
	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg		
1700	.20	-85	15.72	126	.0155	8	.24	-20	2.00	.27
1800	.20	-81	15.00	112	.0182	-20	.19	-29	1.87	.31
1900	.19	-78	15.04	98	.0206	-5	.16	-42	1.69	.34
2000	.20	-74	14.80	84	.0160	-20	.13	-51	2.13	.26
2100	.19	-69	14.79	69	.0177	-30	.10	-59	1.97	.28
2200	.19	-62	15.12	55	.0214	-38	.07	-62	1.66	.33
2300	.19	-50	15.50	38	.0203	-38	.06	-63	1.68	.32
2400	.24	-38	15.60	20	.0229	-36	.04	-58	1.50	.36

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COUGAR COMPONENTS

DIRECT CROSS LIST

Cougar	Amplifonix	Cougar	Amplifonix	Cougar	Amplifonix	Cougar	Amplifonix
AC105	TM7105	AC548	TM6547	AC1218	TM9340	AP2009	TM9709
AC107	TM7207	AC555	TM6416	AC1219	TM9339	AP2509	TM9759
AC251	TM7570	AC556	TM6576	AC1226	TM9337	AR356	TR7256
AC271	TM7270	AC557	TM6516	AC1228	TM9344	AR1094	TR9794
AC272	TM7172	AC558	TM6545	AC1264	TM9164	AR2066	TR9766
AC273	TM7370	AC559	TM6655	AC1266	TM9166	AR2577	TR9777
AC281	TM7481	AC564	TM6664	AC1269	TM9269	AR2584	TM9784
AC282	TM7182	AC566	TM6524	AC1523	TM9523	GC2001	TG9001
AC293	TM7193	AC572	TM6520	AC1525	TM9225	GC2530	TG9030
AC305	TM7147	AC573	TM5673	AC1526	TM9126	LA507	TL9002
AC345	TM7145	AC575	TM6575	AC1527	TM9127	LA1017	TML9017
AC347	TM7347	AC576	TM6276	AC1528	TM9128	LC1501	TL9013
AC378	TM7278	AC577	TM6577	AC1529	TM9329	LC1502	TL9014
AC379	TM7279	AC580	TM6517	AC1582	TM9328	LG2001	TL9003
AC380	TM7381	AC581	TM6581	AC1586	TM9524		
AC381	TM7281	AC582	TM6582	AC2005	TM9135		
AC382	TM7282	AC583	TM6583	AC2017	TM9317		
AC383	TM6683	AC588	TM6588	AC2023	TM9322		
AC386	TM7386	AC751	TM9751	AC2025	TM9341		
AC391	TM7291	AC829	TM6345	AC2034	TM9134		
AC437	TM6587	AC838	TM9183	AC2037	TM9137		
AC453	TM6443	AC847	TM9147	AC2038	TM9138		
AC457	TM6444	AC848	TM9148	AC2039	TM9139		
AC487	TM6487	AC936	TM9192	AC2046	TM9146		
AC501	TM6501	AC986	TM9186	AC2075	TM9725		
AC505	TM6505	AC1012	TM9102	AC2078	TM9778		
AC508	TM6558	AC1017	TM9117	AC2348	TM9748		
AC509	TM6509	AC1018	TM9118	AC2366	TM9343		
AC513	TM6675	AC1019	TM9319	AC2426	TM9342		
AC514	TM6614	AC1022	TM9311	AC2578	TM9345		
AC518	TM6526	AC1035	TM9335	AGC525	TMG9553		
AC519	TM6619	AC1036	TM9113	AP294	TM7294		
AC524	TM6574	AC1037	TM6145	AP348	TM7148		
AC525	TM6625	AC1038	TM9338	AP388	TM7388		
AC540	TM5101	AC1054	TM9325	AP389	TM7189		
AC541	TM5110	AC1057	TM9157	AP448	TM6448		
AC542	TM6147	AC1063	TM9163	AP561	TM6661		
AC543	TM6543	AC1066	TM9366	AP1053	TM9753		
AC544	TM6544	AC1068	TM9368	AP1309	TM9769		
AC545	TM6645	AC1069	TM9369	AP1532	TM9785		
AC547	TM6557	AC1082	TM9107	AP2008	TM9708		

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Direct Cross List

TYCO	Amplifonix	TYCO	Amplifonix	TYCO	Amplifonix	TYCO	Amplifonix
A-1	TM6501	A-36	TM9136	A-74-1	TM7274	A-33	TM9133
A-3	TM6503	A-36-1	TM9336	A-74-2	TM6674	A-34	TM9134
A-5	TM6505	A-37	TM9137	A-75	TM66575	A-35	TM9135
A-5-5	TM6605	A-38	TM9138	A-75-2	TM7275	LA-7	TML9002
A-7	TM6607	A-39	TM9139	A-75-3	TM6675	LA-17	TML9017
A-9	TM6609	A-54	TM6554	A-76	TM6576	LA-88	TML9088
A-11	TM9111	A-55	TM6555	A-77	TM6577	LG-1	TML9003
A-11-2	TM9311	A-56	TM6556	A-77-1	TM6677	RA-89-1	TR6689
A-12	TM9112	A-57	TM6557	A-78	TM7278	A-72	TM6572
A-16-2	TM9316	A-58	TM6558	A-79	TM7279	A-73	TM6573
A-17	TM9117	A-59	TM6559	A-81	TM7281	A-74	TM6574
A-18	TM9118	A-59-1	TM6659	A-81-1	TM7381	LG-30	TML9009
A-18-1	TM9318	A-63	TM9163	A-81-2	TM6581	PA-3	TM6203
A-19	TM9119	A-63-1	TM9363	A-81-3	TM6681	PA-12	TM6212
A-19-1	TM9319	A-64	TM9164	A-82	TM7282	PA-37	TR9737
A-23	TM9123	A-65	TM9165	A-82-1	TM7382	G-30	TG9030
A-24	TM9124	A-66	TM9166	A-83	TM6583	L-1	TL9010
A-25	TM9125	A-66-1	TM9366	A-83-1	TM6683	L-2	TL9011
A-25-1	TM9325	A66-3	TM9566	A-86	TM7286	RA-66	TR9666
A-26	TM9126	A-67	TM9167	A-87	TM6587	RA-69	TR9169
A-27	TM9127	A-67-1	TM6667	A-87-1	TM6487	RA-76	TR6676
A-28	TM9128	A-70	TM7170	A-87-2	TM7287	RA-89	TR6589
A-28-2	TM9328	A-70-1	TM7270	A-88	TM6588		
A-29	TM9129	A-70-2	TM6670	AL-7	TL9012		
A-29-1	TM9329	A-70-3	TM7370	G-1	TG9001		
A-31-1	TM9331	A-71	TM7271	G-2	TG9022		

TYCO, M/A-COM, DIRECT CROSS LIST

M/A-Com	Amplifonix	M/A-Com	Amplifonix	M/A-Com	Amplifonix	M/A-Com	Amplifonix
AMC103	TM6103	AM143	TM6143	AM157	TM6157	AMC123	BX6131
AM112	TM6112	AM145	TM6145	AM162	TM6162	AMC183	TM6183
AM117	TM6117	AM146	FP6146	AM171	TM6171	AMC184	TM6184
AM119	TM6119	AM147	TM6147	AM176	TM6176	AT101	FPG9101
AM124	TM6124	AM149	TM6149	AM181	TM6181		
AM131	TM6131	AM153	TM6153	AM191	TM6191		
AM134	FP6134	AM155	TM6155	AM210	TM6210		

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AVNET, AVANTEK

DIRECT CROSS LIST

Avantek	Amplifonix	Avantek	Amplifonix	Avantek	Amplifonix	Avantek	Amplifonix
AFC330	TKG9330	UTC5-152	BX1560-4	UTO502	TM6605	UTO1011	TM9111
AGC553	TMG9553	UTC11-102	BX1559-4	UTO503	TM6603	UTO1012	TM9312
GPD110	CZ8110	UTC11-108	BX1558-4	UTO504	TM6704	UTO1013	TM9313
GPD120	CZ8120	UTC12-104	BX2531-4	UTO505	TM6705	UTO1023	TM9723
GPD130	CZ8130	UTD2001	TMJ9901	UTO507	TM6507	UTO1024	TM9182
GPD201	CZ8201	UTD2002	TMJ9902	UTO509	TM6509	UTO1033	TM9333
GPD202	CZ8202	UTD2004	TMJ9904	UTO510	TM6510	UTO1043	TM9143
GPD251	CZ8251	UTD1000	TMJ9910	UTO511	TM6511	UTO1044	TM9144
GPD310	CZ8310	UTF015	TG9015	UTO512	TM6512	UTO1502	TM9502
GPD320	CZ8320	UTF025	TG9001	UTO513	TM6513	UTO1522	TM9522
GPD330	CZ8330	UTF030	TG9030	UTO514	TM6514	UTO1524	TM9524
GPD401	CZ8401	UTL502	TML9052	UTO515	TM6515	UTO2012	TM9712
GPD402	CZ8402	UTL503	TML9053	UTO516	TM6516	UTO2013	TM9713
GPD403	CZ8403	UTO101	TM7101	UTO518	TM6518	UTO2022	TM9322
GPD404	CZ8404	UTO102	TM7102	UTO519	TM6519	UTO2023	TM9323
GPD405	CZ8405	UTO103	TM7103	UTO520	TM6520	UTO2024	TM9324
GPD461	CZ8461	UTO104	TM7104	UTO521	TM6521	UTO2025	TM9725
GPD462	CZ8462	UTO111	TM7111	UTO523	TM6523	UTO2027	TM9327
GPD463	CZ8463	UTO210	TM7210	UTO524	TM6524	UTO2052	TM9352
GPD464	CZ8464	UTO211	TM7211	UTO526	TM6526	UTO2055	TM9355
GPM1052	CZ8052	UTO221	TM7221	UTO533	TM6533	UTO2302	TM9302
PPA253	LN7253	UTO222	TM7222	UTO543	TM6543		
PPD2001	LNJ9901	UTO250	TM7250	UTO544	TM6544		
PPD6002	PLJ9962	UTO416	TM6416	UTO545	TM6545		
PPL504	PNL9054	UTO421	TM6421	UTO547	TM6547		
UDL502	TDL9552	UTO440	TM6440	UTO552	TM6152		
UTC5-115	BX2530-4	UTO441	TM6441	UTO554	TM6654		
UTC5-123	BX1556-4	UTO442	TM6442	UTO1001	TM9101		
UTC5-133	BX1557-4	UTO443	TM6443	UTO1002	TM9102		
UTC5-135	BX2529-4	UTO444	TM6444	UTO1005	TM9105		
UTC5-142	BX2532-4	UTO501	TM6601	UTO1006	TM9106		
UTC5-150	BX1561-4			UTO1007	TM9107		

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TYCO. M/A-Com. PHOENIX DIRECT CROSS LIST

TYCO	Amplifonix	TYCO	Amplifonix	TYCO	Amplifonix	TYCO	Amplifonix
PA002	TM7302	PA280	TM9128	PA630	TM9163	PA929	TM9729
PA005	TM6505	PA290	TM9329	PA640	TM9164	PA943	TM6524
PA010	TM6511	PA291	TM9391	PA650	TM9165	PA946	TM9170
PA015	TM9717	PA330	TM9330	PA661	TM6261	PA952	TM6752
PA030	TM6530	PA340	TM9134	PA663	TM9306	PA955	TR9155
PA050	TM6550	PA350	TM9135	PA670	TM9167	PA958	TR4758
PA055	TM7055	PA360	TM9136	PA671	TM6667	PA959	TR4759
PA056	TM7056	PA370	TM9137	PA700	TM7200	PA960	TM9166
PA10	TM5110	PA380	TM9180	PA701	TM7270	PA961	TR4761
PA100	TM9716	PA381	TM9381	PA780	TM7278	PA965	TM6147
PA110	TM9110	PA390	TM9139	PA790	TM7279	PA966	TM7966
PA112	TM9311	PA510	TM5107	PA820	TM7282	PA969	TR4769
PA120	TM9112	PA530	TM6143	PA860	TM7286	PA974	TR4174
PA150	TM9102	PA540	TM6554	PA861	TM9313	PA975	TM5102
PA162	TM9316	PA550	TM6555	PA870	TM6587	PA978	TM9366
PA170	TM9117	PA560	TM6556	PA871	TM6487	PA989	TR9189
PA177	TR4777	PA570	TM5126	PA891L	TR6689	PA984	TR4784
PA179	TR4779	PA702	TM6670	PA899	TM6599	PA992	TR4792
PA180	TM9118	PA703	TM7370	PA902	TM6509	PA1005	TM9705
PA181	TM9318	PA710	TM7271	PA903	TM5103	PA1017	TR4717
PA190	TM9790	PA720	TM6572	PA905	TM5101	PA1028	TM6128
PA191	TM9191	PA740	TM6521	PA907	TM9707	PA1046	TM7102
PA195	TR4795	PA741	TM7274	PA908	TM6508	PA1056	TR4756
PA196	TR4796	PA750	TM6575	PA910	TM5119	PA1059MI	TM7186
PA197	TR4797	PA752	TM7275	PA914	TM6547	PA1060	TR4760
PA198	TR4798	PA753	TM6675	PA915	TM6522	PLA070	TML9002
PA211	TM9181	PA760	TM6576	PA916	TM9706	PPA557	PN6198
PA219	TM6719	PA770	TM6577	PA918	TM7918		
PA240	TM9124	PA771	TM6571	PA919	TM7919		
PA250	TM9502	PA778	TM6178	PA920	TM6519		
PA260	TM9126	PA580	TM7580	PA923	TM6345		
PA270	TM9370	PA590	TM6559	PA926	TM5124		
PA278	TR4778	PA591	TM6659	PA928	TM9528		

TYCO, ANZAC SWITCH DIRECT CROSS LIST

ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX
SW203	TWK2203	SW217	TWD2217	SW241	TWD2241	SW255	TWD2255
SW204	TKP2204	SW218	TWD2218	SW242	TWD2242	SW257	TWD2257
SW205	TWD2205	SW219	TWP2219	SW244	TWD2244	SW258	TWD2258
SW206	TWD2206	SW224	TWK2224	SW245	TWD2245	SW261	TWP2261
SW209	TWP2209	SW231	TWP2231	SW247	TWP2247	SW262	TWP2262
SW213	TWK2213	SW232	TWP2232	SW248	TWP2248	SW264	TWP2264
SW214	TWP2214	SW233	TWP2233	SW251	TWP2251	SW265	TWP2265
SW215	TWD2215	SW234	TWP2234	SW252	TWP2252	SW278	TWN2278
SW216	TWD2216	SW238	TWP2238	SW254	TWD2254		

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VARI-L DIRECT CROSS LIST

Vari-L	Amplifonix	Vari-L	Amplifonix	Vari-L	Amplifonix	Vari-L	Amplifonix
VCO102	TOM9300	VCO106	TOM9309	VCO114	TOM9114	VCO118	TOM9306
VCO104	TOM9303	VCO111	TOM9111	VCO116	TOM9304		
VCO105	TOM9305	VCO113	TOM9301	VCO117	TOM9307		

MOTOROLA DIRECT CROSS LIST

Motorola	Amplifonix	Motorola	Amplifonix	Motorola	Amplifonix	Motorola	Amplifonix
MWA110	CZ8110	MWA210	CZ8210	MWA310	CZ8310	This units are Motorola published "Direct Replacement Devices".	
MWA120	CZ8120	MWA220	CZ8220	MWA320	CZ8320		
MWA130	CZ8130	MWA230	CZ8230	MWA330	CZ8330		

Q-bit DIRECT CROSS LIST

Q-bit	Amplifonix	Q-bit	Amplifonix	Q-bit	Amplifonix	Q-bit	Amplifonix
QBH101	TM5101	QBH119	TM5119	QBH138	TM5138	QBH817	TM5817
QBH102	TM5102	QBH122	TM5122	QBH147	TM5147	QBH822	TM5822
QBH103	TM5103	QBH124	TM5124	QBH149	TM5149	QBH834	TM5834
QBH104	TM5104	QBH125	TM5125	QBH150	TM5150	QBH853	TR5853
QBH105	TM5105	QBH126	TM5126	QBH152	TM5152		
QBH107	TM5107	QBH131	TM5131	QBH155	TM5155		
QBH109	TM5109	QBH133	TM5133	QBH175	TM5175		
QBH110	TM5110	QBH136	TM5136	QBH198	TM5198		
QBH118	TM5118	QBH137	TM5137	QBH304	TM5304		

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Voltage Controlled Oscillators

We also offer drop-in replacement crosses to other manufacturers such as Vari-L.

Vari-L	Amplifonix	Vari-L	Amplifonix	Vari-L	Amplifonix	Vari-L	Amplifonix
VCO102	TOM9300	VCO106	TOM9309	VCO114	TOM9114	VCO118	TOM9306
VCO104	TOM9303	VCO111	TOM9111	VCO116	TOM9304		
VCO105	TOM9305	VCO113	TOM9301	VCO117	TOM9307		

VCO Application Notes

Phase Noise and its effect on your PLL

The center of a Phase Locked Loop is a voltage-controlled oscillator which is locked to a reference frequency. The lock is accomplished using the DC output from a Phase Detector in the loop which is amplified and lowpass filtered providing the correction voltage for the VCO. Phase noise of a PLL output is influenced by the reference signal, loop dividers, loop bandwidth (set by the lowpass filter), and of paramount importance, the VCO. While a clean reference source combined with the extremely high low frequency loop gain will “wipe off” noise within the loop bandwidth, divider and reference spurs often dictate a narrow loop bandwidth. This places the burden of low phase noise on the VCO, since the overall phase noise is equal to that of the free running VCO at carrier offsets outside the loop bandwidth.

Wider bandwidths than a full octave

Generally, a VCO is specified in bandwidths of up to a full octave. To do this, a design must perform not only within the band, but also outside the band in order to duplicate the desired in-band specification in production. At times, the out of bandwidth percentage may be significant. In those cases, we may alter that VCO design and offer it (upon request) as wider than a full octave. Reducing the number of sources in wideband applications enhances frequency agility.

Harmonic Suppression and its effect on PLL's

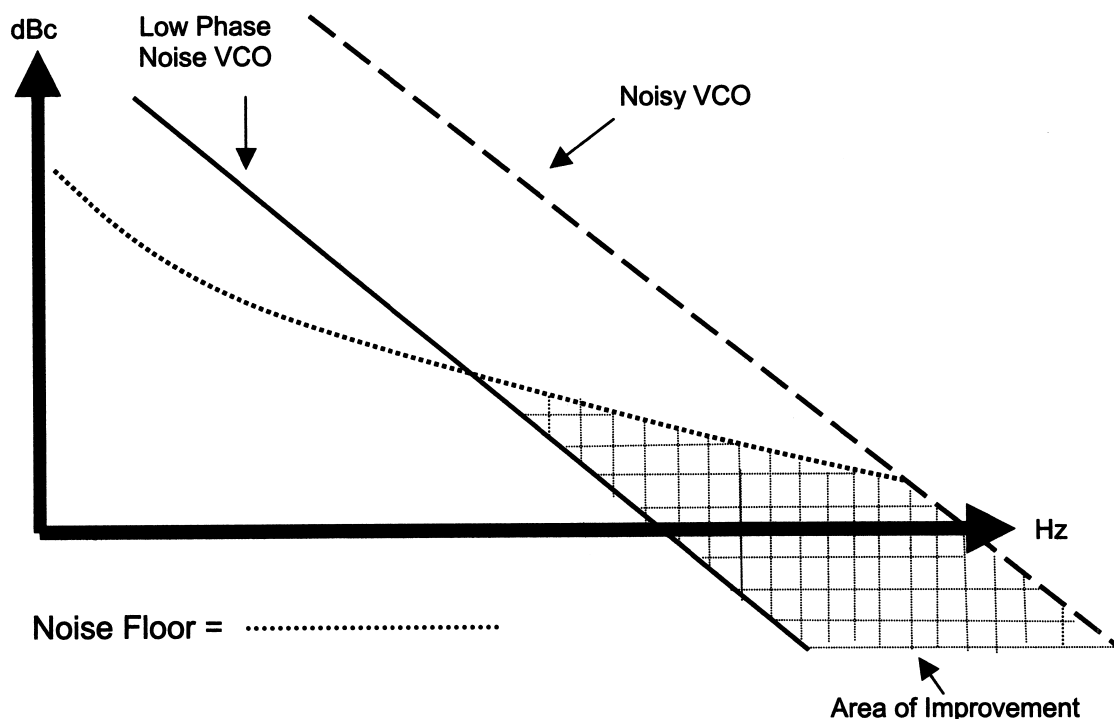
Harmonics can cause problems with PLL prescalers and can create unwanted intermodulation products in communication systems.

How Pulling can be an important parameter

Pulling can cause many problems for a VCO output. Reflection of RF due to load mismatch can cause variations in frequency, power, sensitivity and even phase noise. Time varying load variations are particularly troublesome and can require buffering with an amplifier and additive attenuation.

VCO Application Notes

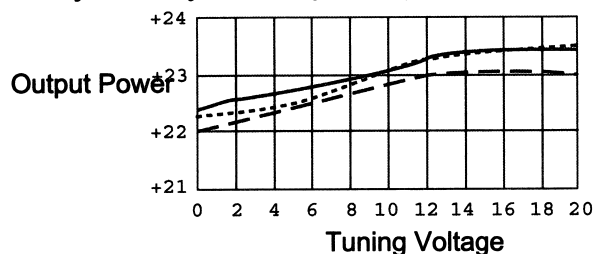
Why is Phase Noise important for a quiet Phase Lock Loop.



The objective in a PLL is to obtain phase lock, plain and simple. One of the elements in a PLL design is a VCO which provides the variable frequency element which is locked to the reference frequency by the loop. Within the loop, the VCO's phase noise approaches the phase noise of the reference signal. Outside of the loop, the phase noise of the VCO takes over and becomes the PLL's output noise. Thus, a quieter VCO yields a loop with lower phase noise above the loop bandwidth.

High power VCO's

For certain applications, higher output power from a VCO can be very helpful. It can eliminate gain blocks usually required to drive high level mixers. It also allows for increased attenuation between the VCO output and its load, minimizing load pulling effects on frequency, power or sensitivity. Many of our standard VCO are available with higher output power. Consult the factory about your unique requirements.



Voltage Controlled Oscillators

Amplifonix has a selection of VCO's from 25 MHz to 5000 Mhz. We specialize in Hermetic, Low Phase Noise VCO's for high performance applications. Amplifonix can also customize a VCO you see here to change its performance to fit your needs.

Model	Frequency Range		Power Output (dBm) Typical	Harmonic Suppression (dBc) Typical	Tuning Voltage (Volts)		Phase Noise @ 100KHz Offset (dBc/Hz) Typical	Power	
	(MHz)				Min.)	(Max.)		(DC) (mA)	
TOM9300	25	50	13	-15	0	20	-136	15	13
TOM9301	40	80	13	-13	0	20	-131	15	14
TOM9302	50	100	12	-15	0	20	-133	15	14
TOM9114	60	120	12	-11	0	20	-130	15	14
TOM9008	70	100	10	-12	0	20	-115	10	10
TOM9009	100	115	10	-12	0	15	-125	10	9.5
TOM9303	100	200	13	-13	0	20	-127	15	15
TOM9304	150	300	13	-15	0	20	-123	15	16
TOM9319	170	300	10	-15	-9	+9	-108	12	34
TOM9338	180	220	17.5	-20	0	12	-120	15	26
TOM9323	200	250	13	-15	4	13	-120	10	14
TOM9305	200	400	12.5	-30	0	20	-125	15	14
TOM9306	250	500	12	-17	0	20	-123	15	15
TOM9307	300	600	12	-15	0	20	-122	15	17
TOM9308	350	400	6	-15	0	5	-130	5	15
TOM9336	385	415	10	-7	0	5	-100	5	33
TOM9309	400	800	12	-15	0	20	-121	15	18
TOM9310	470	570	12	-17	0	15	-118	9	16
TOM9321	400	500	15	-20	0	8	-110	15	25
TOM9311	550	850	12	-20	0	12	-118	12	35
TOM9052	600	900	15	-20	0	15	-122	15	20
TOM9335	750	940	3	-11	0	5	-102	5	8
TOM9328	800	1300	13	-20	0	15	-116	15	22
TOM9100	900	1400	13	-20	0	12	-112	12	22
TOM9090	900	1600	11.5	-14	0	20	-118	15	27
TOM9313	1000	1800	11	-12	0	20	-112	15	20
TOM9314	1200	2000	12	-15	0	20	-110	15	20
TOM9111	1500	2750	12	-20	0	20	-108	15	10
TOM9315	1551	1800	7	-15	0	10	-115	5	20
TOM9320	1700	2300	12.5	-20	3	15	-105	15	45
TOM9330	1700	2700	12	-20	0	20	-101	15	19
TOM9331	1725	1790	9.5	-30	0	5	-104	5	30
TOM9329	1875	1975	7	-30	0	7.5	-105	5	24
TOM9250	2000	2500	12	-15	0	15	-105	15	30
TOM9327	2200	2300	7	-30	0	7.5	-105	5	27
TOM9325	2200	2700	12	-18	1.5	10	-105	12	33
TOM9326	2255	2280	6	-24	0.5	4.5	-105	5	20
TOM9316	2500	4000	9	-15	0	20	-105	15	25
TOM9340	3200	4000	10	-15	0	12	-95	12	27
TOM9317	3500	4500	7	-15	0	20	-100	15	25
TOM9339	3900	4100	9.5	-16	0	12	-95	12	21
TOM9318	4000	5000	7	-15	0	20	-100	15	25

VOLTAGE CONTROLLED OSCILLATOR

TOM9008

70-100 MHz

Available as:

TOM9008, 4 Pin TO-8 (T4)

TON9008, 4 Pin Surface Mount (SM3)

BXO9008, Connectorized Housing (H1)

Features

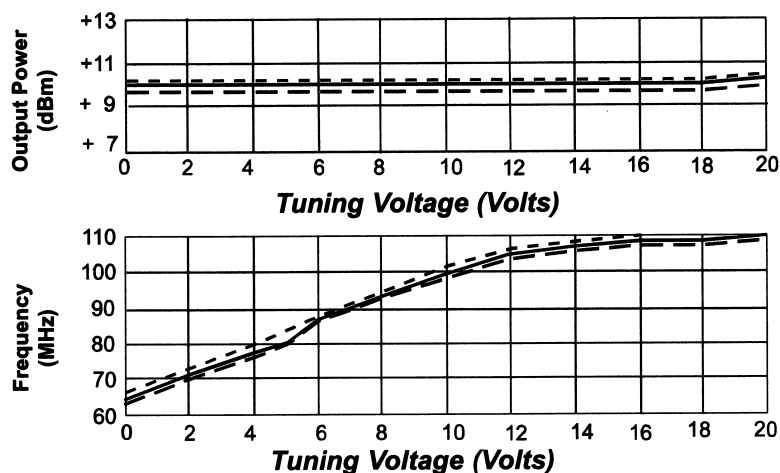
- Low Noise Bipolar Transistor
- Operating Case Temp. -20 °C to + 60 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -20°C to +60 °C
Frequency	70 - 100 MHz	70 - 100 MHz
Output Power (dBm)	+10.0	+7.0 Min.
Power Flatness (dBm)	±0.2	±1.0 Max.
Tuning Voltage Range (V)	2 to 10	1 to 20
Tuning Voltage Sensitivity (MHz/V)	4.0	1.0
Harmonics (dBc)	-12	-8 Max.
Spurious (dBc)	< -80	- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-115	-110 Max.
Pushing (MHz/V)	0.2	0.65 Max.
Pulling (MHz); 12 dB RL	1.2	6.0 Max.
Frequency Drift (MHz/°C)	-0.012	-0.035 Max.
Power Vdc	+10	+10
mA	9.5	10.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C ······ -40 °C

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volt

V _i (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	64.0		+ 8.7	-12	- 11
1.00	68.7	4.7	+ 9.9	-12	- 11
2.00	72.1	3.4	+ 9.9	-12	- 12
3.00	75.0	2.9	+ 9.9	-12	- 12
4.00	77.9	2.9	+ 9.9	-12	- 12
5.00	81.3	3.4	+ 9.9	-12	- 12
6.00	85.6	4.3	+ 9.9	-12	- 12
7.00	90.6	5.0	+ 9.9	-12	- 12
8.00	95.4	4.8	+ 9.9	-12	- 12
9.00	99.2	3.8	+ 9.9	-12	- 12
10.00	102.2	3.0	+ 9.8	-12	- 12
11.00	104.7	2.5	+ 9.8	-12	- 12
12.00	106.7	2.0	+ 9.8	-13	- 12
13.00	108.3	1.6	+ 9.7	-12	- 12
14.00	109.6	1.3	+ 9.8	-13	- 12
15.00	110.8	1.2	+ 9.7	-13	- 12
16.00	111.7	0.9	+ 9.7	-13	- 12
17.00	112.5	0.8	+ 9.6	-12	- 12
18.00	113.3	0.8	+ 9.5	-13	- 12
19.00	113.9	0.6	+ 9.5	-13	- 12
20.00	114.4	0.5	+ 9.6	-13	- 12

Amplifonix

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03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9009

100-150 MHz

Available as:

TOM9009, 4 Pin TO-8 (T4)

TON9009, 4 Pin Surface Mount (SM3)

BXO9009, Connectorized Housing (H1)

Features

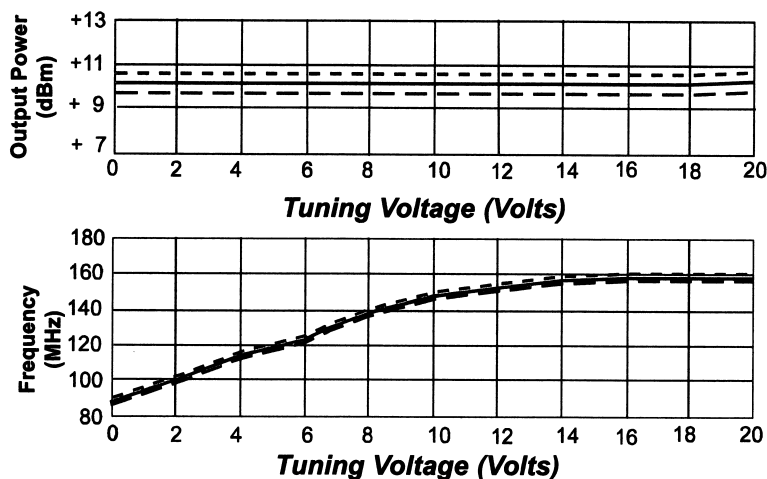
- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -20 °C to + 60 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -20°C to +60 °C
Frequency	100 - 150 MHz	100 - 150 MHz
Output Power (dBm)	+10.0	+7.0 Min.
Power Flatness (dBm)	±0.2	±1.0 Max.
Tuning Voltage Range (V)	2 to 8	1 to 15
Tuning Voltage Sensitivity (MHz/V)	7.0	4.0
Harmonics (dBc)	-12	-8 Max.
Spurious (dBc)	< -80	-80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-125	-120 Max.
Pushing (MHz/V)	0.2	1.0 Max.
Pulling (MHz); 12 dB RL	3.0	6.0 Max.
Frequency Drift (MHz/°C)	-0.02	-0.05 Max.
Power Vdc	+10	+10
mA	9.5	10.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C - - - - -40 °C

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volt

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	88.2		+10.29	-13.31	-11.87
1.00	94.6	6.4	+10.24	-13.36	-11.64
2.00	99.4	4.8	+10.24	-13.30	-11.58
3.00	104.0	4.6	+10.23	-13.34	-11.63
4.00	109.3	5.3	+10.23	-12.91	-11.66
5.00	115.5	6.2	+10.22	-12.70	-11.97
6.00	122.5	7.0	+10.20	-12.77	-11.98
7.00	129.6	7.1	+10.18	-13.00	-12.12
8.00	135.7	6.1	+10.16	-13.60	-12.32
9.00	140.9	5.2	+10.14	-13.96	-12.35
10.00	145.1	4.2	+10.12	-14.19	-12.47
11.00	148.2	3.1	+10.11	-14.41	-12.69
12.00	150.7	2.5	+10.10	-14.69	-12.83
13.00	152.5	1.8	+10.09	-14.89	-12.77
14.00	153.7	1.2	+10.09	-14.93	-12.76
15.00	154.5	0.8	+10.08	-15.11	-12.70

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03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9052

600 - 900 MHz

Available as:

TOM9052, 4 Pin TO-8 (T4)
TON9052, 4 Pin Surface Mount (SM3)
TOP9052, 4 Pin Flatpack (FP4)
BXO9052, Connectorized Housing (H1)

Features

- Broad Tuning Range
- Low Noise Bipolar Transistor
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

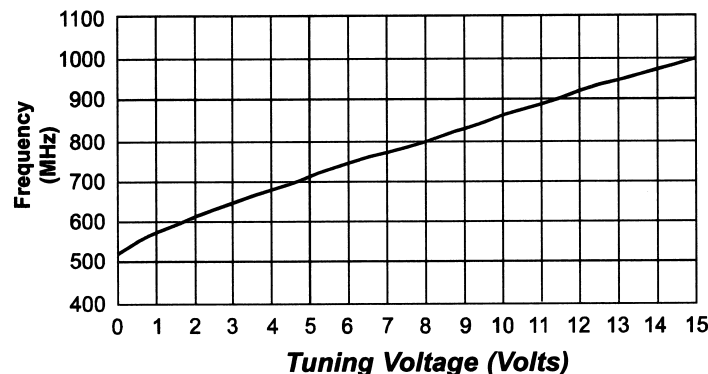
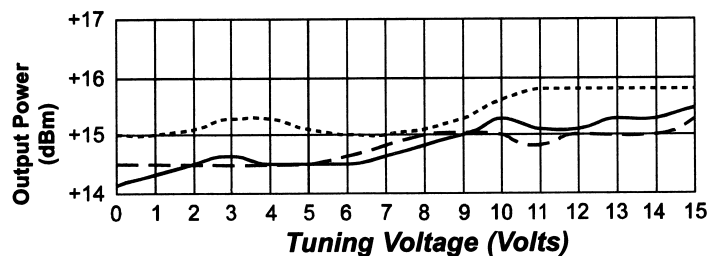
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	600 - 900 MHz	600 - 900 MHz
Output Power (dBm)	+15	+13.0 Min.
Power Flatness (dB)	±0.7	±1.0 Max.
Tuning Voltage Range (v)	1.5 to 12	0 to 15
Tuning Voltage Sensitivity (MHz/V)	25	20 Min.
Harmonics (dBc)	-20	-12 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW Zg = 50 Ohms		5 Min.
Pushing (MHz/V)	2	4.0 Max.
Pulling (MHz); 12 dB RL	15	20 Max.
Frequency Drift (MHz/°C)	—	0.1 Max.
Power Vdc	+15	+15
mA	20	25.0 Max.

Maximum Ratings

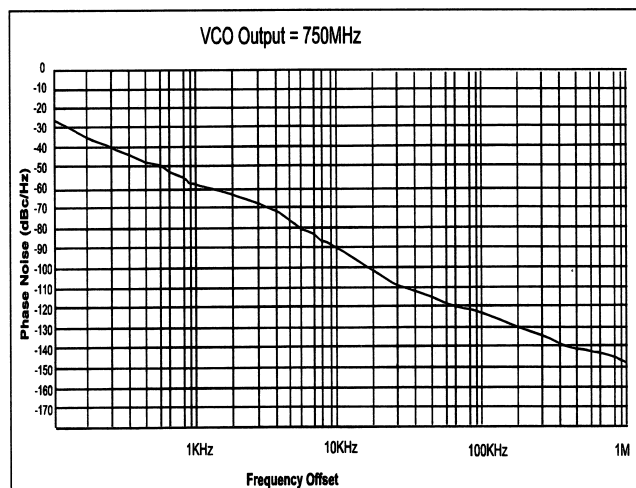
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -118dBc/Hz.

Amplifonix

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VOLTAGE CONTROLLED OSCILLATOR

TOM9090

900 - 1600 MHz

Available as:

TOM9090, 4 Pin TO-8 (T4)
TON9090, 4 Pin Surface Mount (SM3)
TOP9090, 4 Pin Flatpack (FP4)
BXO9090, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

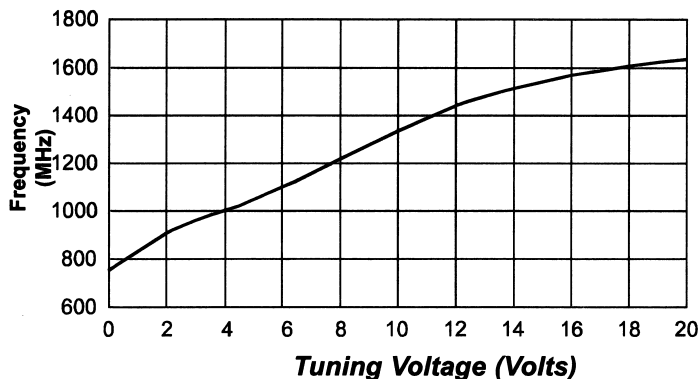
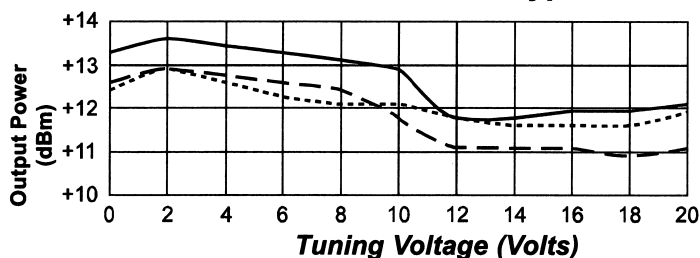
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	900 - 1600 MHz	900 - 1600 MHz
Output Power (dBm)	+11.5	+10.0 Min.
Power Flatness (dB)	±1.0	±2.0 Max.
Tuning Voltage Range (v)	2 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	20	15 Min.
Harmonics (dBc)	-14	-10 Max.
Spurious (dBc)	<-80	-60 Max.
3dB Modulation BW, Zg = 50 Ohms	—	10MHz Min.
Pushing (MHz/V)	2.0	3.0 Max.
Pulling (MHz); 12 dB RL	25	30 Max.
Frequency Drift (MHz/°C)	—	0.3 Max.
Power Vdc	+15	+15
mA	27	35.0

Maximum Ratings

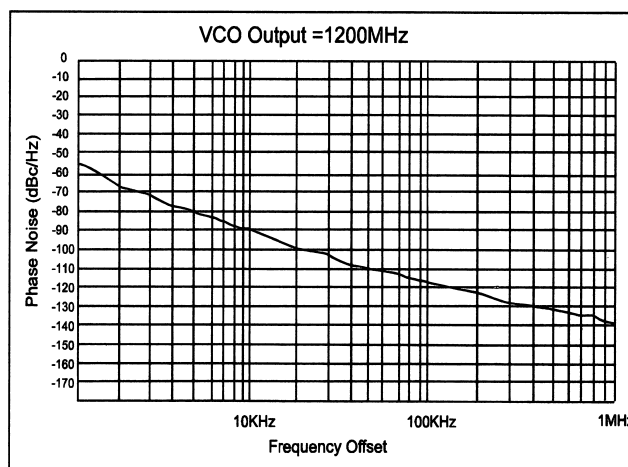
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ----- + 25 °C - - - - +85 °C - - - - -55°C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -110 dBc/Hz.

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TEL 215-464-4000 •••• FAX 215-464-4001 Rev.A 04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9100

900 - 1400 MHz

Available as:

TOM9100, 4 Pin TO-8 (T4)
TON9100-3, 4 Pin Surface Mount (SM3)
TOP9100-4, 4 Pin Flatpack (FP4)
BXO9100, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -40 °C to + 85 °C
- Environmental Screening available

Specifications

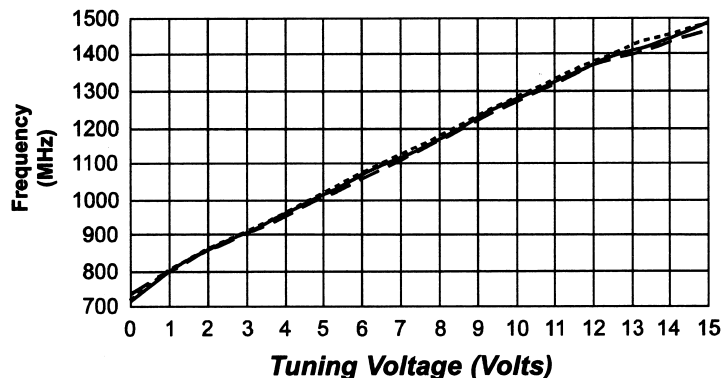
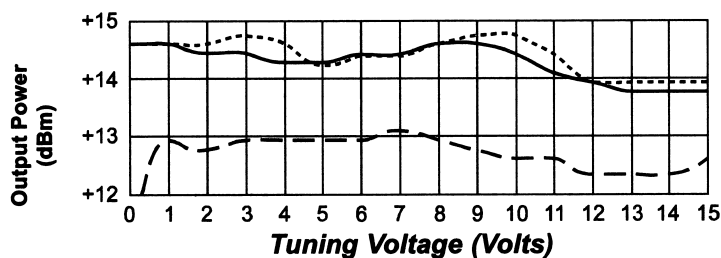
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -40 °C to +85 °C
Frequency	900 - 1400 MHz	900 - 1400 MHz
Output Power (dBm)	+13	+11.0 Min.
Power Flatness (dB)	±0.4	±0.6 Max.
Tuning Voltage Range (v)	1 to 12	1 to 15
Tuning Voltage Sensitivity (MHz/V)	50	30 Min.
Harmonics (dBc)	<-20	-12 Max.
Spurious (dBc)	<-80	-80 Max.
Phase Noise @ 100 KHz (dBc/hz)	-112	- Max.
Pushing (MHz/V)	<2	3.0 Max.
Pulling (MHz); 12 dB RL	30	40.0 Max.
Frequency Drift (MHz/°C)	0.15	0.3 Max.
Power Vdc	+12	+12
mA	22	25.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ----- + 25 °C ----- +85 °C - - - - -40 °C

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.0	729.6		+14.6	-15.0	-15.3
1.00	801.0	71.4	+14.6	-18.5	-17.0
2.00	859.5	58.6	+14.4	+25.5	-17.8
3.00	911.6	52.1	+14.4	-31.2	-19.0
4.00	962.1	50.5	+14.3	-27.8	-20.0
5.00	1013.9	51.7	+14.3	-25.2	-20.7
6.00	1066.5	52.6	+14.4	-23.3	-21.0
7.00	1119.3	52.9	+14.4	-23.3	-22.2
8.00	1172.7	53.4	+14.6	-23.3	-23.2
9.00	1224.8	52.2	+14.6	-22.8	-24.8
10.00	1277.5	52.7	+14.4	-22.0	-27.2
11.00	1326.3	48.8	+14.1	-20.0	-30.7
12.00	1371.9	45.6	+13.9	-20.2	-34.8
13.00	1411.8	39.9	+13.8	-20.7	-36.5
14.00	1445.5	33.6	+13.8	-21.0	-37.2
15.00	1477.3	31.8	+13.8	-21.3	-37.3

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10/04/00

VOLTAGE CONTROLLED OSCILLATOR

TOM9111

1500 - 2750 MHz

Available as:

TOM9111, 4 Pin TO-8 (T4)
TON9111, 4 Pin Surface Mount (SM3)
TOP9111, 4 Pin Flatpack (FP4)
BXO9111, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

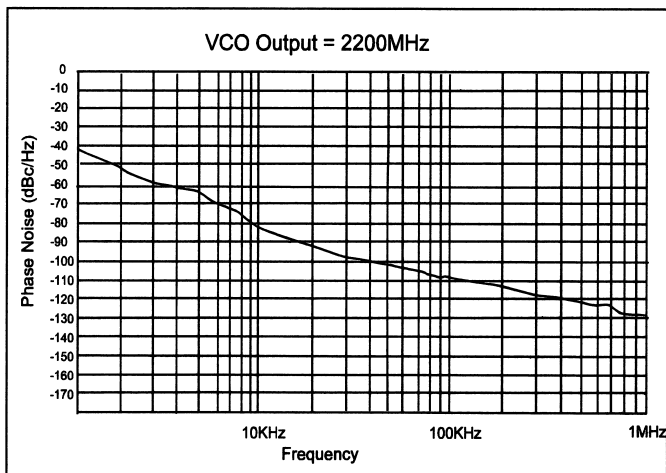
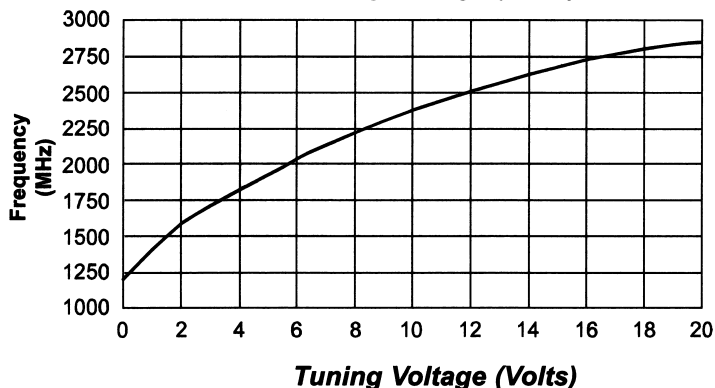
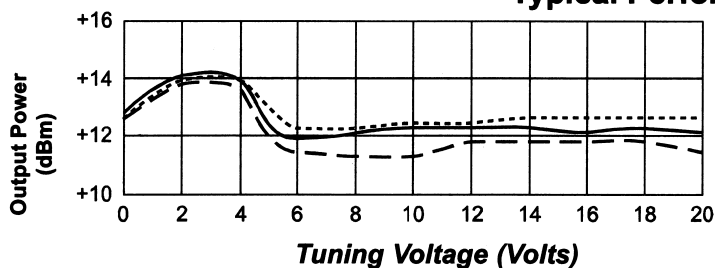
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	1500 - 2750 MHz	1500 - 2750 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dB)	±1.5	±1.5 Max.
Tuning Voltage Range (v)	2 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	80	30 Min.
Harmonics (dBc)	- 20	- 10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg =50 Ohms	---	15MHz Min
Pushing (MHz/V)	2.0	5.0 Max.
Pulling (MHz); 22 dB RL	30	45 Max.
Frequency Drift (MHz/°C)	—	0.5 Max.
Power Vdc	+15	+15
mA	19	25

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -100dBc/Hz.

Legend ——— + 25 °C - - - - - +85 °C - - - - - -55 °C

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Rev.B 04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9114

60 - 120 MHz

Available as:

TOM9114, 4 Pin TO-8 (T4)
TON9114, 4 Pin Surface Mount (SM3)
TOP9114, 4 Pin Flatpack (FP4)
BXO9114, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

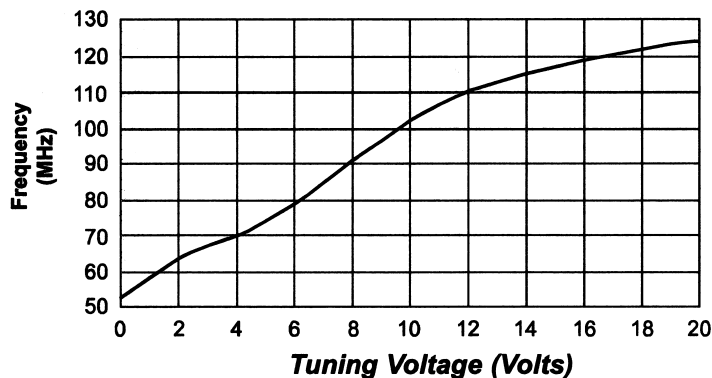
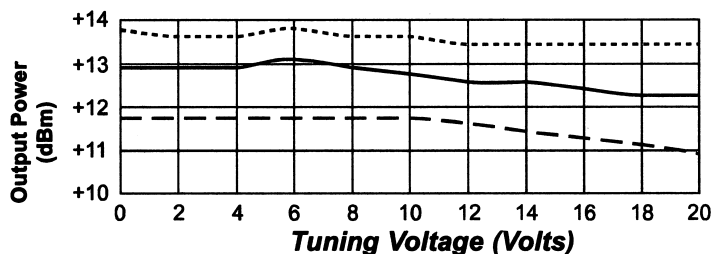
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	60 - 120 MHz	60 - 120 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dB)	±0.4	±0.6 Max.
Tuning Voltage Range (v)	1 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	4	1.5 Min.
Harmonics (dBc)	-11	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohms	---	1MHz Min.
Pushing (MHz/V)	0.25	1.0 Max.
Pulling (MHz); 12 dB RL	1	3.0 Max.
Frequency Drift (MHz/°C)	---	0.03 Max.
Power Vdc	+15	+15
mA	14	17

Maximum Ratings

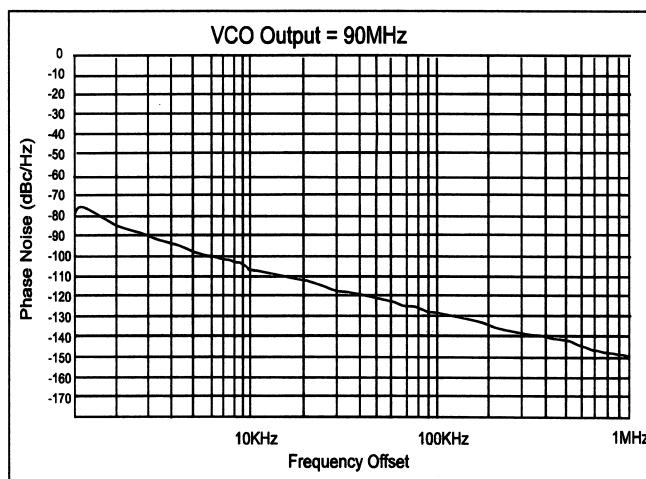
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ----- + 25 °C ----- +85 °C - - - - -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -120 dBc/Hz.

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Rev.A 04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9211

1500 - 2750 MHz

Available as:
 TOM9211, 4 Pin TO-8 (T4)
 TON9211, 4 Pin Surface Mount (SM3)
 TOP9211, 4 Pin Flatpack (FP4)
 BXO9211, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 100 °C
- Environmental Screening available

Specifications

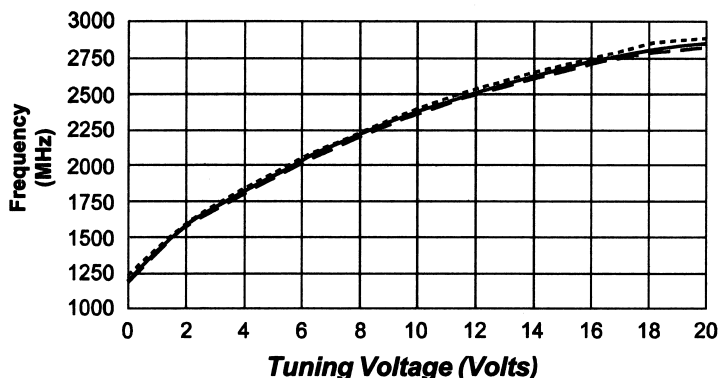
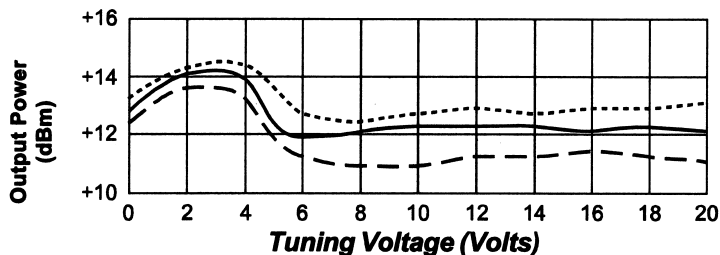
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +100 °C
Frequency	1500 - 2750 MHz	1500 - 2750 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dB)	±1.5	±1.5 Max.
Tuning Voltage Range (v)	2 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	80	30 Min.
Harmonics (dBc)	-20	-12 Max.
Spurious (dBc)	<-80	-80 Max.
Phase Noise @ 100 KHz (dBc/hz)	-110	-104 Max.
Pushing (MHz/V)	< 2.0	4.0 Max.
Pulling (MHz); 22 dB RL	30	45 Max.
Frequency Drift (MHz/°C)	—	0.5 Max.
Power Vdc	+15	+15
mA	19	20.0

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 20 Volts
 Maximum DC Tuning Voltage + 22 Volts
 Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +100 °C - - - - -55 °C

V _t (V)	f _o (MHz)	Δ f (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	1198.0		+12.8	-18.3	-11.8
1.00	1409.7	211.7	+13.9	-22.2	-16.3
2.00	1582.6	172.9	+14.1	-21.8	-19.5
3.00	1713.3	130.7	+13.9	-17.5	-21.8
4.00	1817.4	104.2	+13.9	-17.0	-25.0
5.00	1931.3	113.8	+12.9	21.2	-33.2
6.00	2041.8	110.5	+11.9	-37.8	-27.0
7.00	2135.4	93.7	+12.1	-30.7	-26.8
8.00	2220.7	85.3	+12.1	-27.0	-24.2
9.00	2301.5	80.8	+12.1	-25.7	-25.1
10.00	2378.3	76.8	+12.3	-25.3	-25.5
11.00	2449.2	70.8	+12.4	25.8	-26.5
12.00	2515.4	66.3	+12.3	26.2	-27.4
13.00	2576.9	61.5	+12.3	26.7	-29.3
14.00	2633.4	56.5	+12.3	27.2	-32.2
15.00	2684.7	51.3	+12.4	27.8	-32.0
16.00	2730.6	45.9	+12.1	28.3	-31.6
17.00	2770.4	39.8	+12.3	29.3	-32.0
18.00	2803.8	33.3	+12.3	29.5	-31.7
19.00	2829.9	26.2	+12.1	29.7	-33.1
20.00	2849.4	19.5	+12.1	30.2	-33.2

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03/30/01

VOLTAGE CONTROLLED OSCILLATOR

TOM9250

2000 - 2500 MHz

Available as:

TOM9250, 4 Pin TO-8 (T4)
TON9250-3, 4 Pin Surface Mount (SM3)
TOP9250-4, 4 Pin Flatpack (FP4)
BXO9250, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

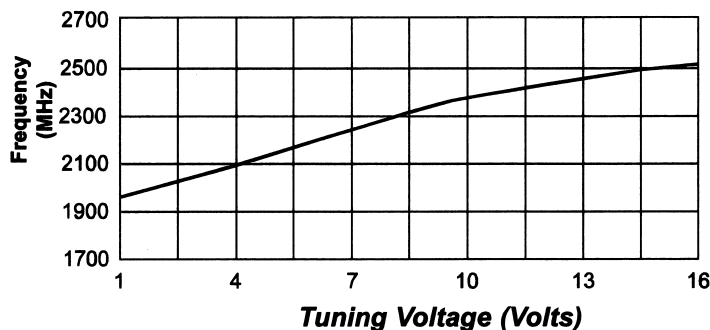
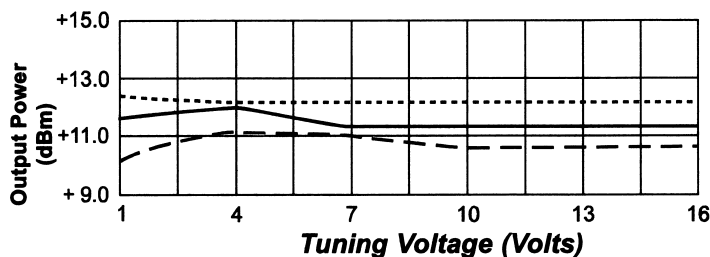
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
5Frequency	2000 - 2500 MHz	2000 - 2500 MHz
Output Power (dBm)	+11.5	+9.0 Min.
Power Flatness (dB)	±0.75	±1.5 Max.
Tuning Voltage Range (v)	1 to 14	1 to 15
Tuning Voltage Sensitivity (MHz/V)	40	15 Min.
Harmonics (dBc)	-20	-12 Max.
Spurious (dBc)	<-80	<-60 Max.
3dB Modulation BW Zg = 50 Ohm	---	20MHz Min.
Pushing (MHz/V)	4	9 Max.
Pulling (MHz); 20 dB RL	25	35 Max.
Frequency Drift (MHz/°C)	0.10	0.15 Max.
Power	Vdc	
	mA	
	+15	+15
	30	40

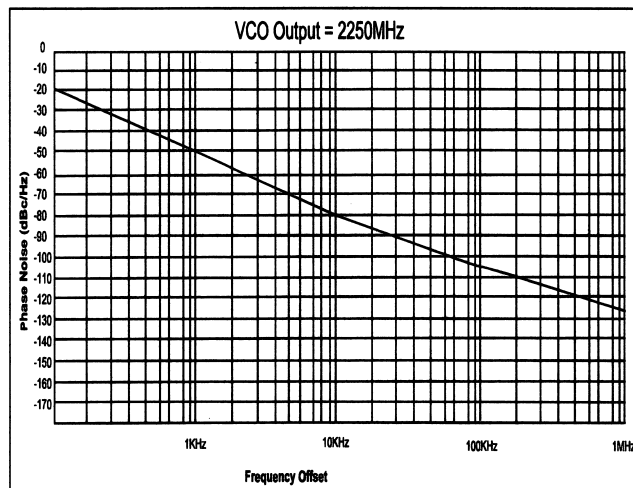
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Typical Performance Data



Legend ----- + 25 °C ----- +85 °C ----- -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -100 dBc/Hz.

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Rev. C 04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9300

25 - 50 MHz

Available as:

TOM9300, 4 Pin TO-8 (T4)
TON9300, 4 Pin Surface Mount (SM3)
TOP9300, 4 Pin Flatpack (FP4)
BXO9300, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

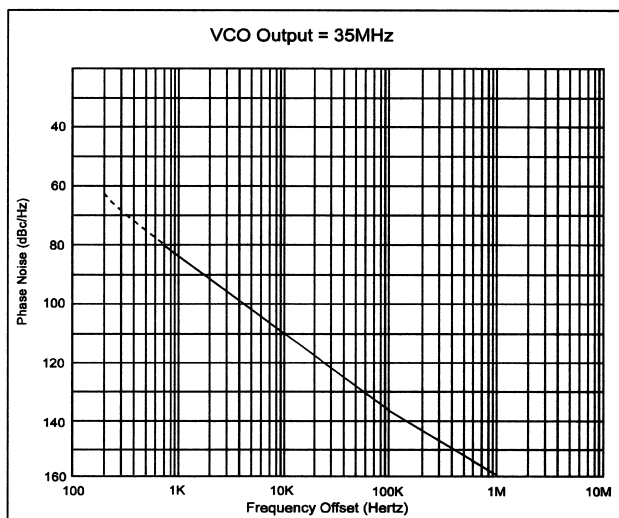
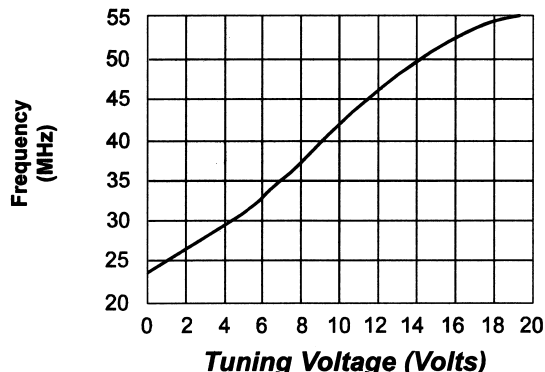
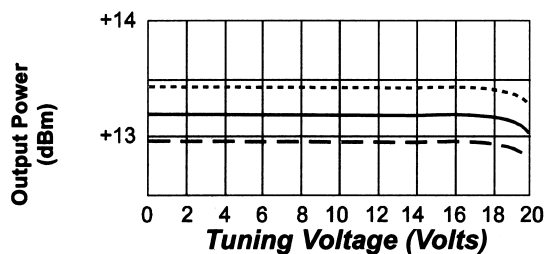
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	25 - 50 MHz	25 - 50 MHz
Output Power (dBm)	+13	+10 Min.
Power Flatness (dB)	±0.5	±1.0 Max.
Tuning Voltage Range (v)	1 to 15	0 to 20
Tuning Voltage Sensitivity (MHz/V)	2.0	1 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	.1MHz Min.
Pushing (MHz/V)	.20	.30 Max.
Pulling (MHz); 12dB RL	1.25	2.0 Max.
Frequency Drift (MHz/°C)	—	-.01 Max.
Power Vdc	+15	+15
mA	13	16 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -130 dBc/Hz.

Legend ——— + 25 °C - - - - - +85 °C - - - - -55 °C

Amplifonix

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9301

40 - 80 MHz

Available as:

TOM9301, 4 Pin TO-8 (T4)
TON9301, 4 Pin Surface Mount (SM3)
TOP9301, 4 Pin Flatpack (FP4)
BXO9301, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

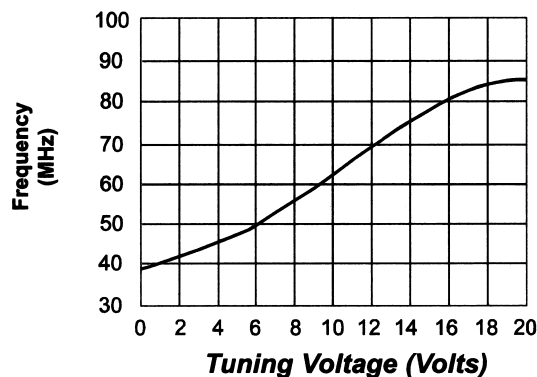
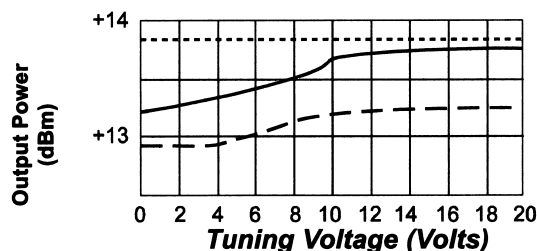
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	40 MHz	80 MHz
Output Power (dBm)	+13	+10 Min.
Power Flatness (dB)	±0.6	±2.0 Max.
Tuning Voltage Range (v)	1 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	2.5	1.0 Min.
Harmonics (dBc)	-13	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	.2MHz Min.
Pushing (MHz/V)	0.3	1.0 Max.
Pulling (MHz); 12dB RL	2	4 Max.
Frequency Drift (MHz/°C)	---	.02 Max.
Power Vdc	+15	+15
mA	14	18 Max.

Maximum Ratings

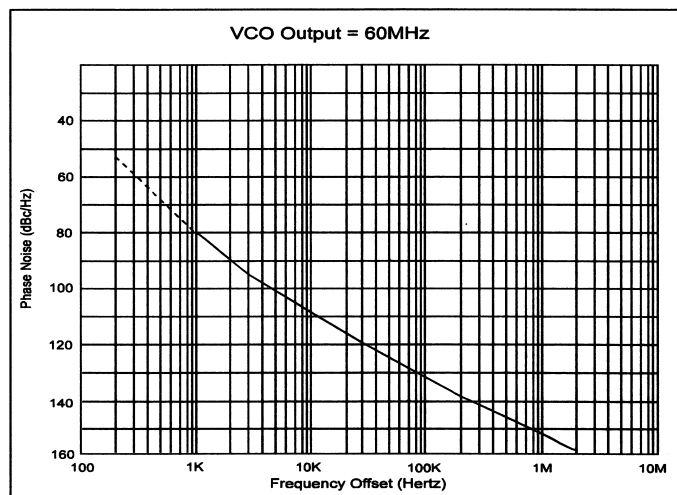
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - +85 °C -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -125 dBc/Hz.

Amplifonix

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9302

50 - 100 MHz

Available as:
TOM9302, 4 Pin TO-8 (T4)
TON9302, 4 Pin Surface Mount (SM3)
TOP9302, 4 Pin Flatpack (FP4)
BXO9302, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

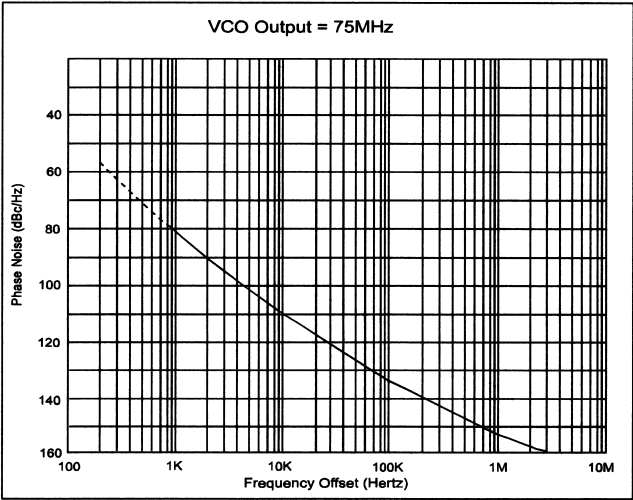
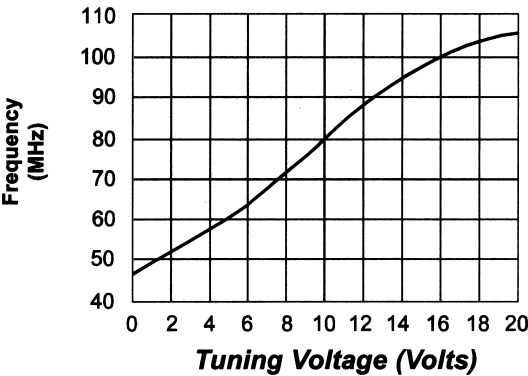
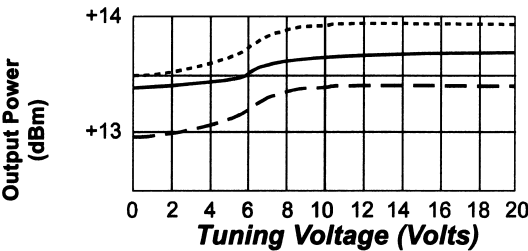
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	50 - 100 MHz	50 - 100 MHz
Output Power (dBm)	+12	+10 Min.
Power Flatness (dB)	±1.0	±1.5 Max.
Tuning Voltage Range (v)	1 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	4	1.5 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	.3MHz Min.
Pushing (MHz/V)	.5	1.5 Max.
Pulling (MHz); 12dB RL	3	5.0 Max.
Frequency Drift (MHz/°C)	---	.05 Max.
Power Vdc	+15	+15
mA	14	18 Max.

Maximum Ratings

Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



- Notes:
1. Phase Noise is measured using the Aeroflex PN9000.
 2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -130 dBc/Hz.

Legend ——— + 25 °C - - - - - +85 °C - - - - -54 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001 04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9303

100 - 200 MHz

Available as:

TOM9303, 4 Pin TO-8 (T4)
TON9303, 4 Pin Surface Mount (SM3)
TOP9303, 4 Pin Flatpack (FP4)
BXO9303, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available.

Specifications

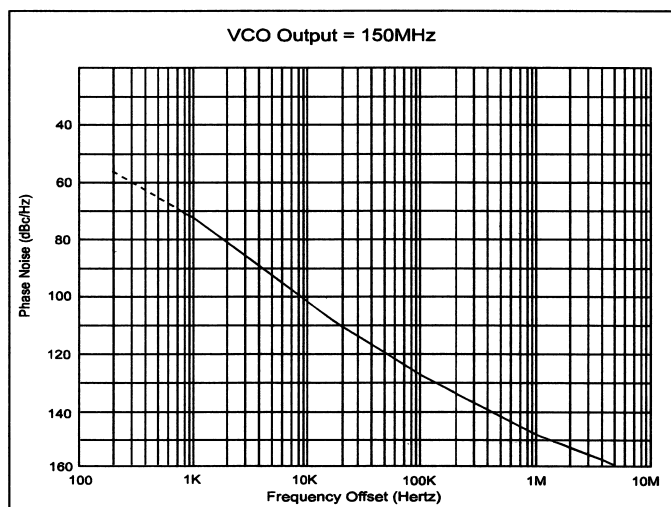
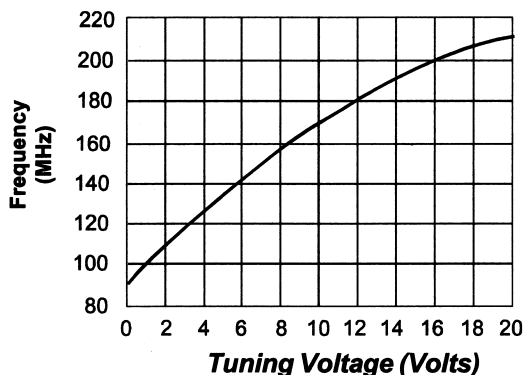
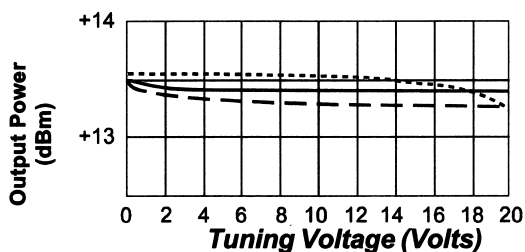
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	100 - 200 MHz	100 - 200MHz
Output Power (dBm)	13	+10 Min.
Power Flatness (dB)	±1	±2.0 Max.
Tuning Voltage Range (v)	1 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	6	2 Min.
Harmonics (dBc)	-13	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	.5MHz Min.
Pushing (MHz/V)	1	2.0 Max.
Pulling (MHz); 12dB RL	5	10 Max.
Frequency Drift (MHz/°C)	—	.07 Max.
Power	Vdc	+15
	mA	15
		20

Maximum Ratings

Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -125 dBc/Hz.

Legend ——— + 25 °C - - - - +85 °C - - - - -54 °C

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04/11/02

VOLTAGE CONTROLLED
OSCILLATOR

TOM9304
150 - 300 MHz

Available as:
TOM9304, 4 Pin TO-8 (T4)
TON9304, 4 Pin Surface Mount (SM3)
TOP9304, 4 Pin Flatpack (FP4)
BXO9304, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

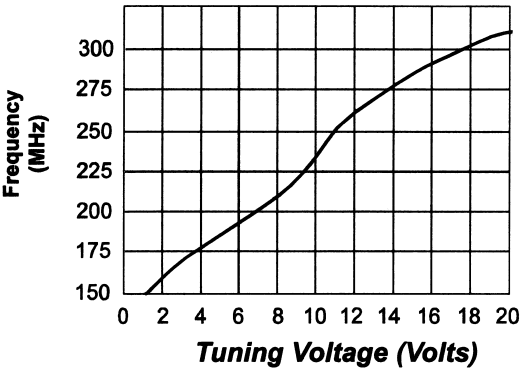
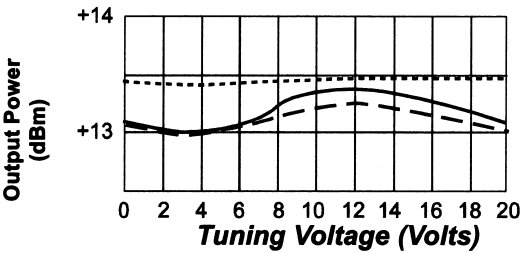
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	150 - 300 MHz	150 - 300 MHz
Output Power (dBm)	+13	+10 Min.
Power Flatness (dB)	±0.5	±1.0 Max.
Tuning Voltage Range (v)	1 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	9	3 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	.5MHz Min.
Pushing (MHz/V)	1	4 Max.
Pulling (MHz); 12dB RL	5	10 Max.
Frequency Drift (MHz/°C)	---	.05 Max.
Power Vdc	+15	+15
mA	16	20 Max.

Maximum Ratings

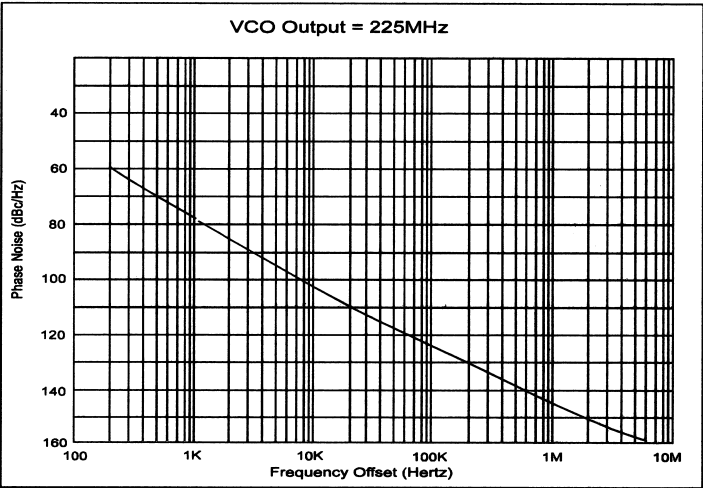
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - +85 °C -54 °C



- Notes:
1. Phase Noise is measured using the Aeroflex PN9000.
 2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -120 dBc/Hz.



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VOLTAGE CONTROLLED OSCILLATOR

TOM9305

200 - 400 MHz

Available as:

TOM9305, 4 Pin TO-8 (T4)
TON9305, 4 Pin Surface Mount (SM3)
TOP9305, 4 Pin Flatpack (FP4)
BXO9305, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening Available

Specifications

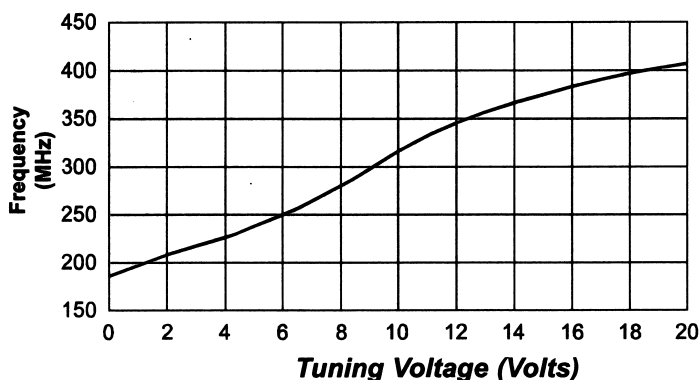
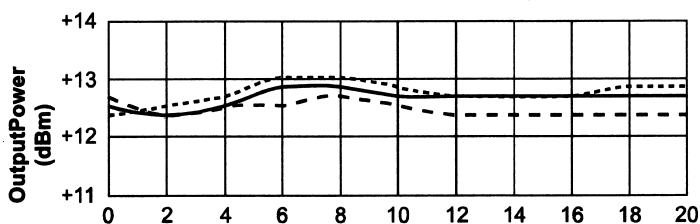
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -55°C to +85 °C
Frequency	200 - 400 MHz	200 - 400 MHz
Output Power (dBm)	+12.5	+10.0 Min.
Power Flatness (dB)	±0.4	±1.0 Max.
Tuning Voltage Range (v)	1 to 19	0 to 20
Tuning Voltage Sensitivity (MHz/V)	20	5.0 Min.
Harmonics (dBc)	-30	-17 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohms	---	3MHz Min.
Pushing (MHz/V)	1.0	2.0 Max.
Pulling (MHz); 12 dB RL	4	9.0 Max.
Frequency Drift (MHz/°C)	—	0.1 Max.
Power Vdc	+15	+15
mA	14	18 Max.

Maximum Ratings

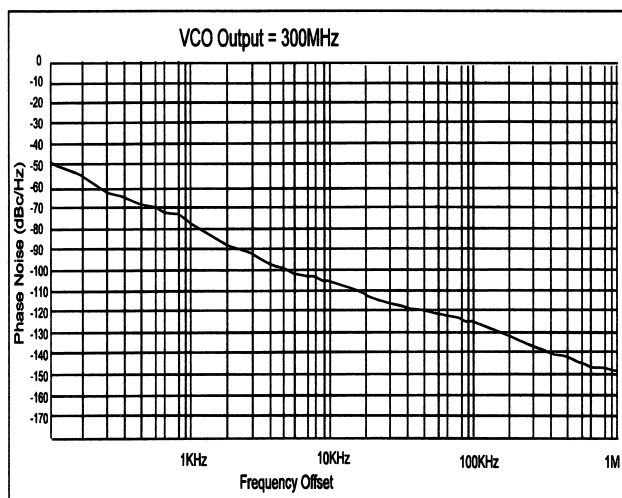
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C - - - - -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -120dBc/Hz.

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VOLTAGE CONTROLLED
OSCILLATOR

TOM9306
250 - 500 MHz

Available as:
TOM9306, 4 Pin TO-8 (T4)
TON9306, 4 Pin Surface Mount (SM3)
TOP9306, 4 Pin Flatpack (FP4)
BXO9306, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

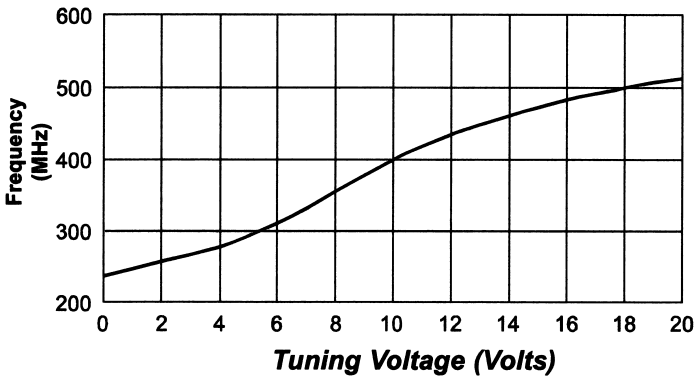
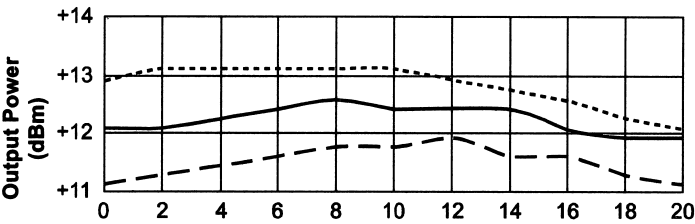
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	250 - 500 MHz	250 - 500 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dB)	± 0.4	± 1.0 Max.
Tuning Voltage Range (v)	1to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	15	5 Min.
Harmonics (dBc)	-17	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohms	---	4MHz Min.
Pushing (MHz/V)	1	3.0 Max.
Pulling (MHz); 12 dB RL	3	8.0 Max.
Frequency Drift (MHz/°C)	—	0.05 Max.
Power Vdc	+15	+15
mA	15	20.0

Maximum Ratings

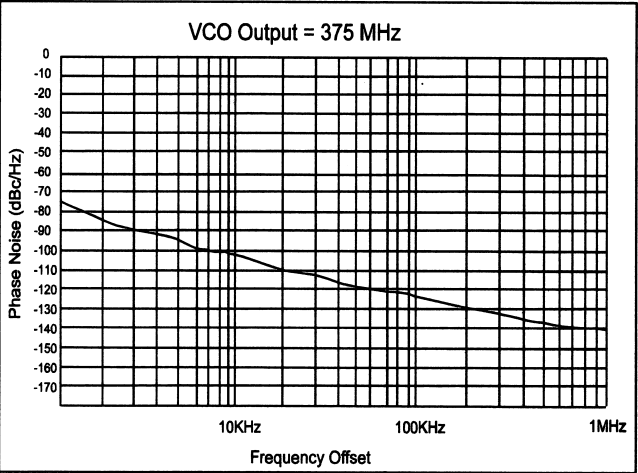
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - +85 °C -55 °C



- Notes:
1. Phase Noise is measured using the Aeroflex PN9000.
 2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -120dBc/Hz.



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VOLTAGE CONTROLLED OSCILLATOR

TOM9307

300 - 600 MHz

Available as:

TOM9307, 4 Pin TO-8 (T4)
TON9307, 4 Pin Surface Mount (SM3)
TOP9307, 4 Pin Flatpack (FP4)
BXO9307, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

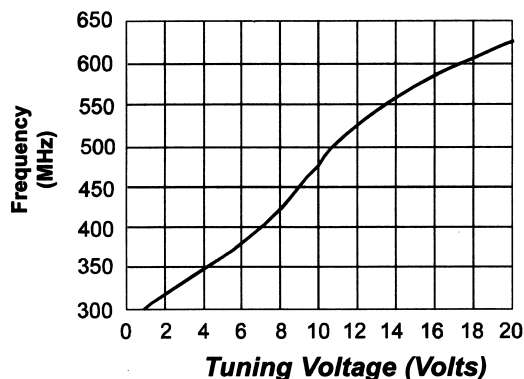
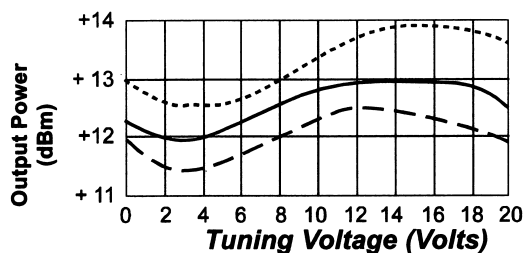
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	300 - 600 MHz	300 - 600 MHz
Output Power (dBm)	12	+10 Min.
Power Flatness (dB)	±1	±2.0 Max.
Tuning Voltage Range (v)	1 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	20	5 Min.
Harmonics (dBc)	-15	-10
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	8MHz Min.
Pushing (MHz/V)	2	4 Max.
Pulling (MHz); 12dB RL	5	15 Max.
Frequency Drift (MHz/°C)	—	-.05 Max.
Power Vdc	+15	+15
mA	17	25

Maximum Ratings

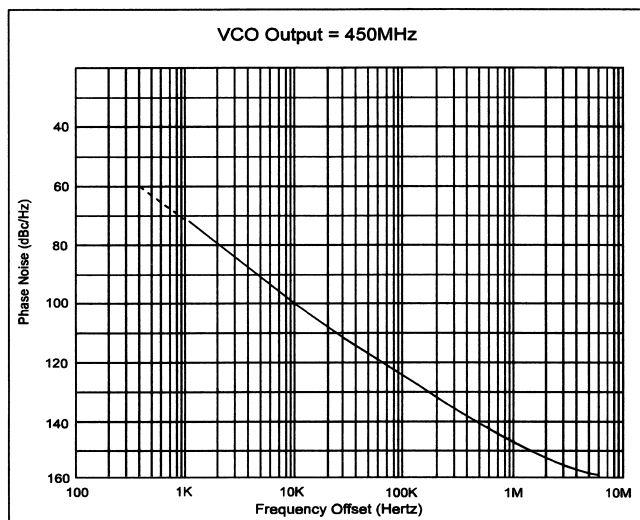
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature..... + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - +85 °C - - - -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is - 120 dBc/Hz.

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VOLTAGE CONTROLLED OSCILLATOR

TOM9308

350 - 400 MHz

Available as:

TOM9308, 4 Pin TO-8 (T4)
TON9308, 4 Pin Surface Mount (SM3)
TOP9308, 4 Pin Flatpack (FP4)
BXO9308, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

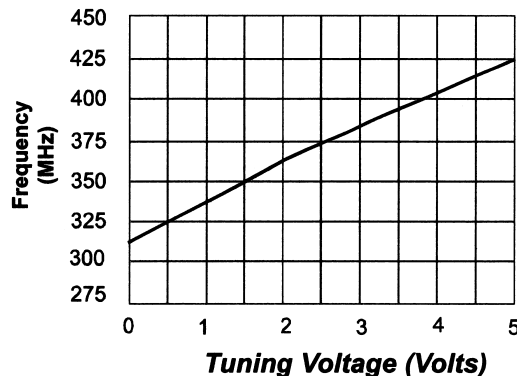
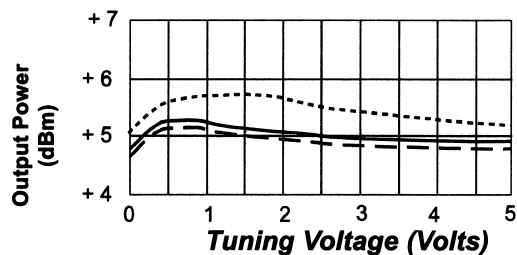
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	350 - 400 MHz	350 - 400 MHz
Output Power (dBm)	+6	+4 Min.
Power Flatness (dB)	±0.6	±0.8 Max.
Tuning Voltage Range (v)	1 to 4	0 to 5
Tuning Voltage Sensitivity (MHz/V)	25	15 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	5MHz Min.
Pushing (MHz/V)	1	3.0 Max.
Pulling (MHz); 12dB RL	2	5 Max.
Frequency Drift (MHz/°C)	---	.04 Max.
Power	Vdc mA	+5 16 Max.

Maximum Ratings

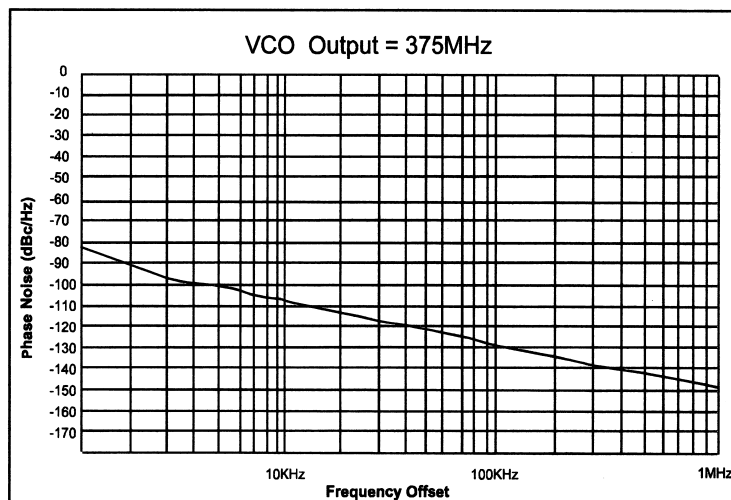
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 10 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is - 120 dBc/Hz.

Amplifonix

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VOLTAGE CONTROLLED OSCILLATOR

TOM9309

400 - 800 MHz

Available as:

TOM9309, 4 Pin TO-8 (T4)
TON9309, 4 Pin Surface Mount (SM3)
TOP9309, 4 Pin Flatpack (FP4)
BXO9309, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

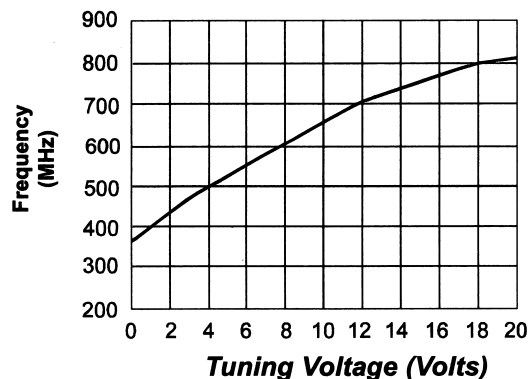
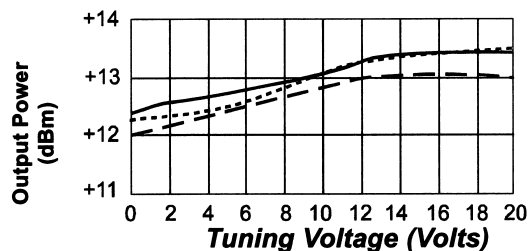
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	400 - 800 MHz	400 - 800 MHz
Output Power (dBm)	12	10 Min.
Power Flatness (dB)	±1	±2 Max.
Tuning Voltage Range (v)	1 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	25	10 Min.
Harmonics (dBc)	-15	-10
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	10MHz Min.
Pushing (MHz/V)	1	4 Max.
Pulling (MHz); 12dB RL	10	25 Max.
Frequency Drift (MHz/°C)	—	-.07 Max.
Power Vdc	+15	+15
mA	18	25

Maximum Ratings

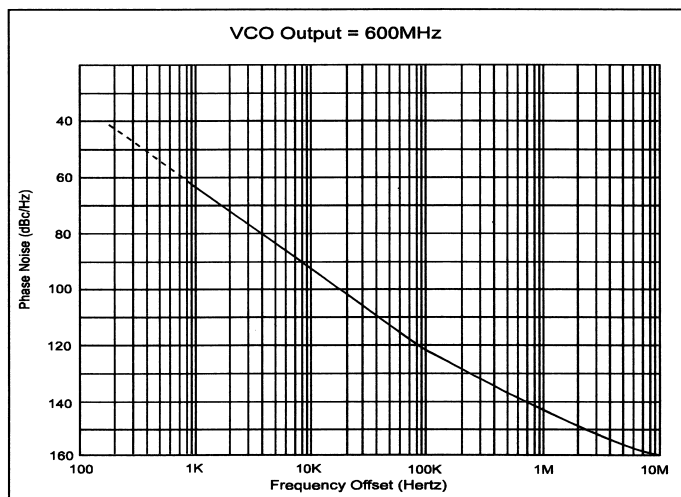
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -118 dBc/Hz.

Amplifonix

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9310

470 - 570 MHz

Available as:
TOMA9310, 4 Pin TO-8 (T4)
TONA9310, 4 Pin Surface Mount (SM3)
TOPA9310, 4 Pin Flatpack (FP4)
BXOA9310, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

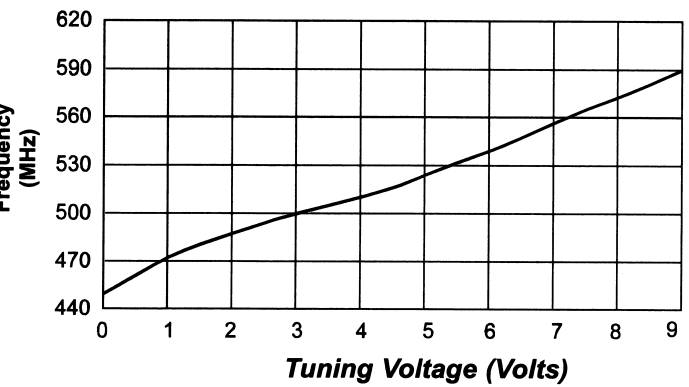
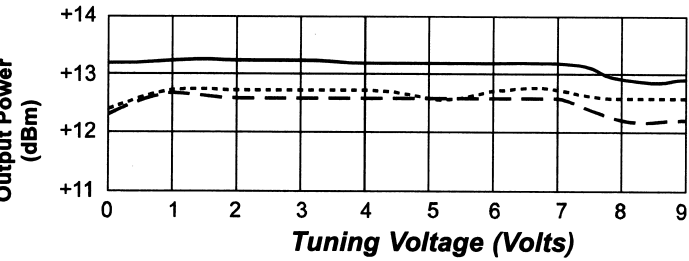
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	470 - 570 MHz	470 - 570 MHz
Output Power (dBm)	+12	+10. Min.
Power Flatness (dB)	±0.25	±0.5 Max.
Tuning Voltage Range (v)	1 to 10	0 to 15
Tuning Voltage Sensitivity (MHz/V)	25	10 Min.
Harmonics (dBc)	-17	-12 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohms	----	5MHz Min.
Pushing (MHz/V)	0.5	1.0 Max.
Pulling (MHz); 12 dB RL	12	20 Max.
Frequency Drift (MHz/°C)	0.125	0.25 Max.
Power Vdc	+ 9	+ 9
mA	16	20.0 Max.

Maximum Ratings

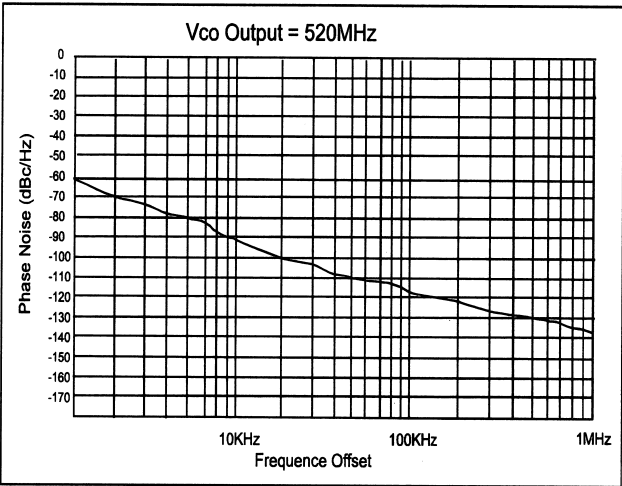
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 15 Volts
Maximum DC Tuning Voltage + 15 Volts
Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ----- + 25 °C ----- +85 °C ----- -55 °C



- Notes:
1. Phase Noise is measured using the Aeroflex PN9000.
 2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -110dBc/Hz.



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VOLTAGE CONTROLLED OSCILLATOR

TOM9311

550 - 850 MHz

Available as:

TOM9311, 4 Pin TO-8 (T4)
TON9311, 4 Pin Surface Mount (SM3)
TOP9311, 4 Pin Flatpack (FP4)
BXO9311, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

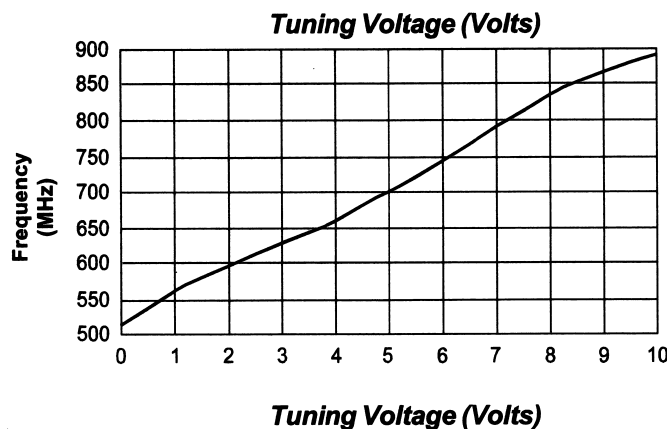
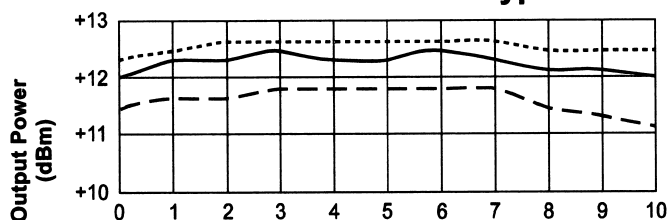
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	550 - 850 MHz	550 - 850 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dB)	±0.3	±1.0 Max.
Tuning Voltage Range (v)	1 to 10	0 to 12
Tuning Voltage Sensitivity (MHz/V)	30	20 Min.
Harmonics (dBc)	-20	-15 Max.
Spurious (dBc)	<-80	- 80 Max.
Phase Noise @ 100 KHz (dBc/hz)	----	5MHz Min.
Pushing (MHz/V)	3	4.0 Max.
Pulling (MHz); 20 dB RL	10	15.0 Max.
Frequency Drift (MHz/°C)	0.3	0.7 Max.
Power Vdc	+12	+12
mA	35	40.0

Maximum Ratings

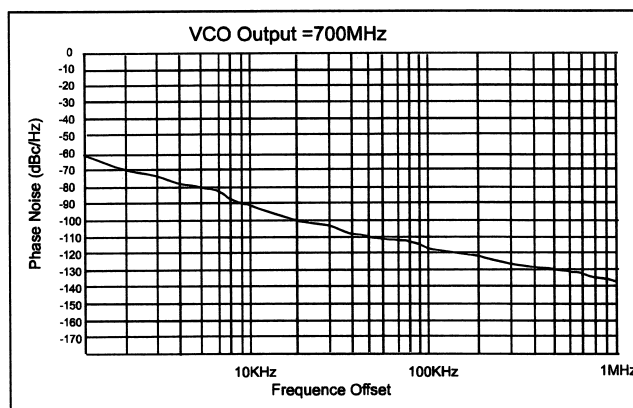
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C --- +85 °C -55 °C



Notes:

1. Phase noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is - 100 dBc/Hz.

Amplifonix

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VOLTAGE CONTROLLED OSCILLATOR

TOM9313

1000 - 1800 MHz

Available as:

TOM9313, 4 Pin TO-8 (T4)
TON9313, 4 Pin Surface Mount (SM3)
TOP9313, 4 Pin Flatpack (FP4)
BXO9313, Connectorized Housing (H1)

Features

- Broad Tuning Range
- Low Noise Bipolar Transistor
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

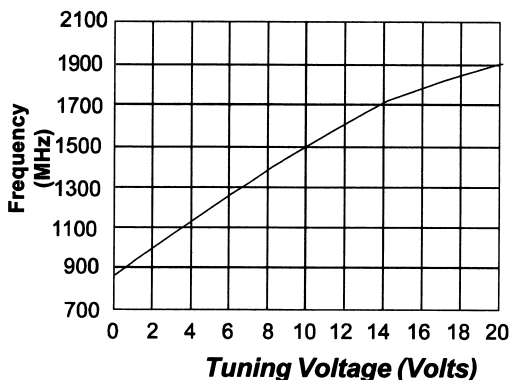
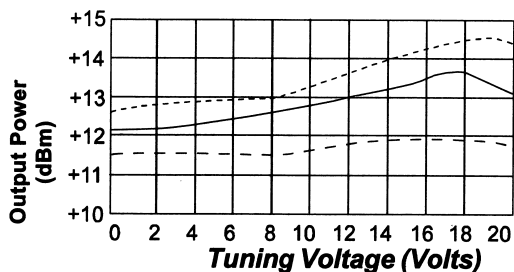
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to + 85 °C
Frequency	1000 - 1800 MHz	1000 - 1800 MHz
Output Power (dBm)	12	10 Min.
Power Flatness (dB)	±1.0	±2.0 Max.
Tuning Voltage Range (v)	1 to 18	0 to 20
Tuning Voltage		
Sensitivity (MHz/V)	50	25 Min.
Harmonics (dBc)	-15	-10
Spurious (dBc)	<-80	-60 Max.
3dB Modulation BW, Zg = 50 Ohm	---	15MHz Min.
Pushing (MHz/V)	10	15 Max.
Pulling (MHz); 14dB RL	15	30 Max.
Frequency Drift (MHz/°C)	—	.30 Max.
Power		
Vdc	+15	+15
mA	19	25

Maximum Ratings

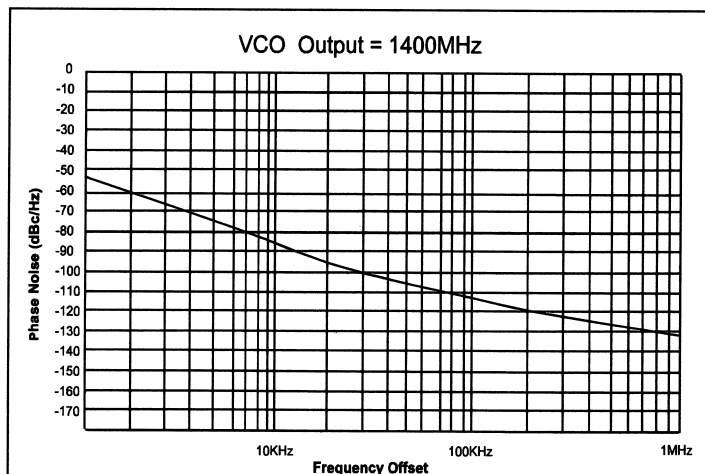
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85°C - - - - -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -110 dBc/Hz.

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9314

1200 - 2000 MHz

Available as:

TOM9314, 4 Pin TO-8 (T4)
TON9314, 4 Pin Surface Mount (SM3)
TOP9314, 4 Pin Flatpack (FP4)
BXO9314, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

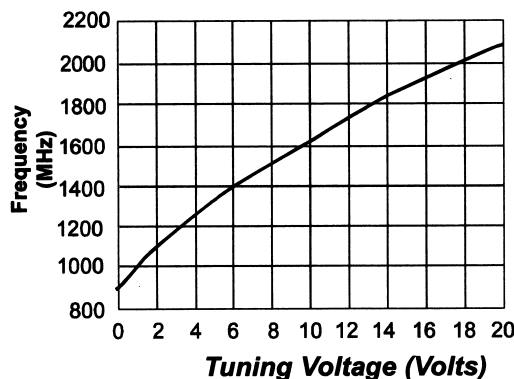
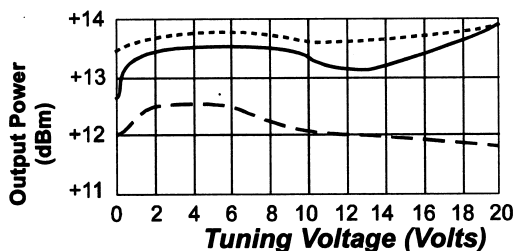
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	1200 - 2000 MHz	1200 - 2000 MHz
Output Power (dBm)	12	10 Min.
Power Flatness (dB)	±1	±2 Max.
Tuning Voltage Range (v)	3 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	65	25 Min.
Harmonics (dBc)	15	-10
Spurious (dBc)	<-80	- 60 Max.
3dB Modulation BW, Zg = 50 Ohm	---	15MHz Min.
Pushing (MHz/V)	10	20 Max.
Pulling (MHz); 14dB RL	15	30 Max.
Frequency Drift (MHz/°C)	—	-.35 Max.
Power Vdc	+15	+15
mA	20	30

Maximum Ratings

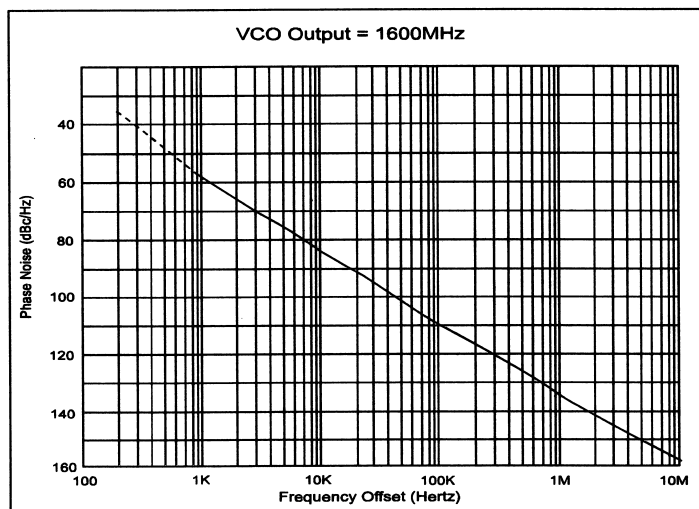
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - +85 °C - - - - -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -105 dBc/Hz.

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9315

1550 - 1800 MHz

Available as:

TOM9315, 4 Pin TO-8 (T4)
TON9315, 4 Pin Surface Mount (SM3)
TOP9315, 4 Pin Flatpack (FP4)
BXO9315, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

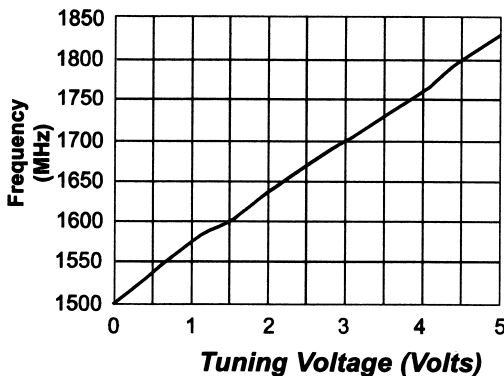
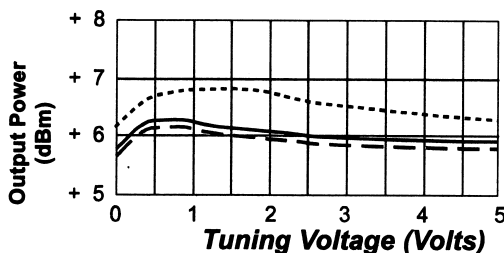
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	1550 - 1800 MHz	1550 - 1800 MHz
Output Power (dBm)	+7.0	+5 Min.
Power Flatness (dB)	±1.0	±1.5 Max.
Tuning Voltage Range (v)	1 to 4.5	0 to 5
Tuning Voltage Sensitivity (MHz/V)	65	50 Min.
Harmonics (dBc)	-20	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	10MHz Min.
Pushing (MHz/V)	4	10 Max.
Pulling (MHz); 12dB RL	15	20 Max.
Frequency Drift (MHz/°C)	—	- 0.3 Max.
Power Vdc	+5	+5
mA	22	30 Max.

Maximum Ratings

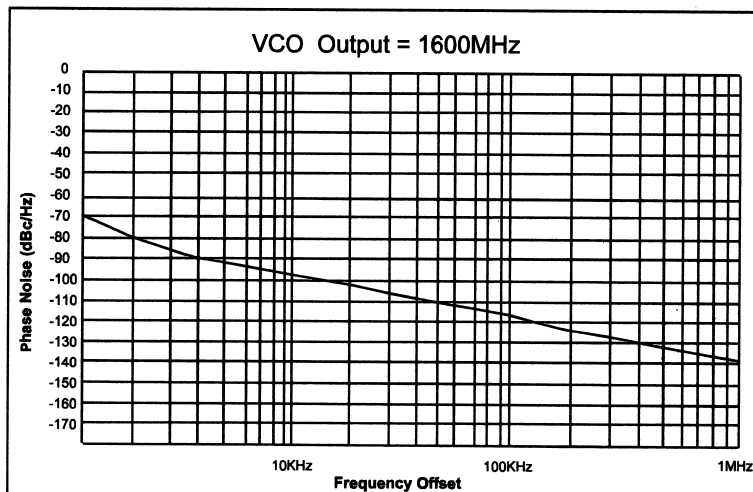
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C -54 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -110 dBc/Hz.

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9316

2500 - 4000 MHz

Available as:

TOM9316, 4 Pin TO-8 (T4)
TON9316, 4 Pin Surface Mount (SM3)
TOP9316, 4 Pin Flatpack (FP4)
BXO9316, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

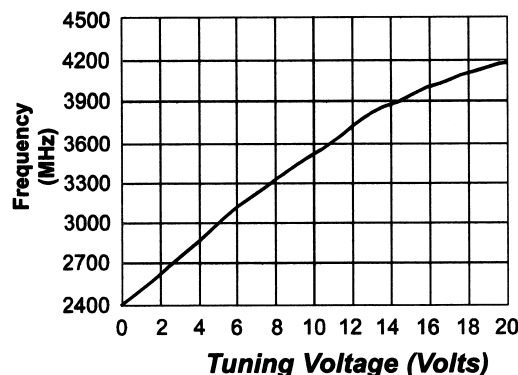
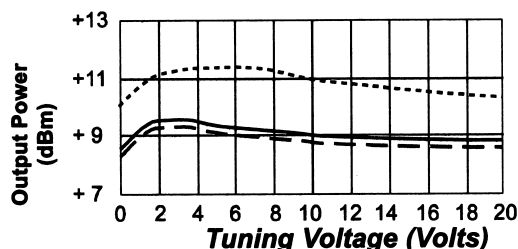
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	2500 - 4000 MHz	2500 - 4000 MHz
Output Power (dBm)	+9	+7 Min.
Power Flatness (dB)	±1.0	±2.0 Max.
Tuning Voltage Range (v)	1 to 18	0 to 20
Tuning Voltage Sensitivity (MHz/V)	85	25 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg =50 Ohms	---	15MHz Min.
Pushing (MHz/V)	5	15 Max.
Pulling (MHz); 22 dB RL	15	25 Max.
Frequency Drift (MHz/°C)	—	- 0.5 Max.
Power Vdc	+15	+15
mA	25	30 Max.

Maximum Ratings

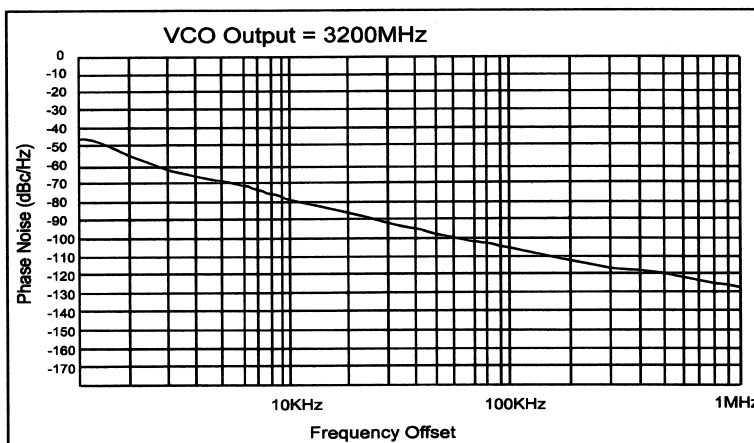
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - - + 85 °C -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -100dBc/Hz.

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9317

3500 - 4500 MHz

Available as:

TOM9317, 4 Pin TO-8 (T4)
TON9317, 4 Pin Surface Mount (SM3)
TOP9317, 4 Pin Flatpack (FP4)
BXO9317, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

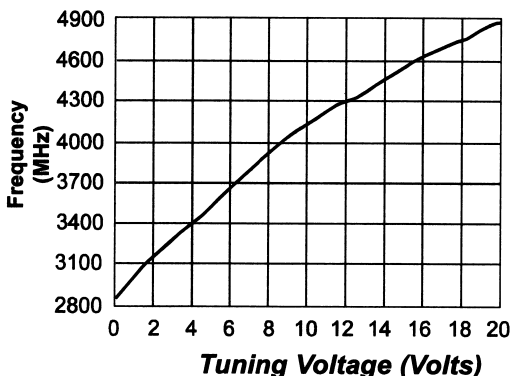
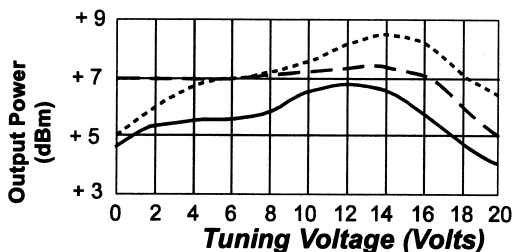
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	3500 - 4500 MHz	3500 - 4500 MHz
Output Power (dBm)	+7	+5 Min.
Power Flatness (dB)	±1.0	±2.0 Max.
Tuning Voltage Range (v)	4 to 15	0 to 20
Tuning Voltage Sensitivity (MHz/V)	85	25 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
3dB Modulation BW, Zg = 50 Ohm	—	20Mhz Min.
Pushing (MHz/V)	5	15 Max.
Pulling (MHz); 22dB RL	15	25 Max.
Frequency Drift (MHz/°C)	—	- 0.5 Max.
Power Vdc	+15	+15
mA	25	30 Max.

Maximum Ratings

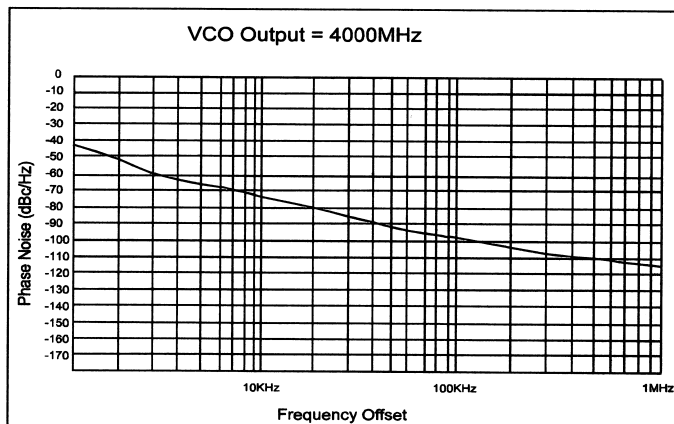
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - - +85 °C - - - - -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -90 dBc/Hz.

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9318

4000 - 5000 MHz

Available as:

TOM9318, 4 Pin TO-8 (T4)
TON9318, 4 Pin Surface Mount (SM3)
TOP9318, 4 Pin Flatpack (FP4)
BXO9318, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

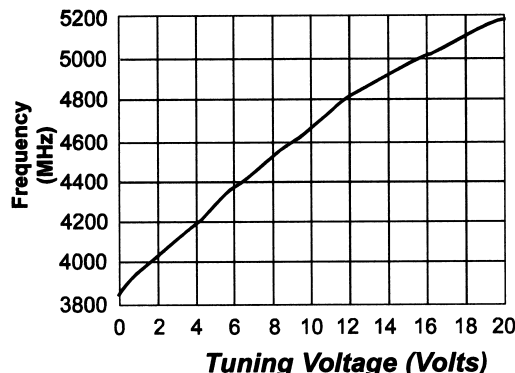
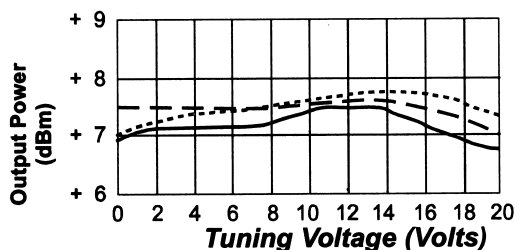
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	4000 - 5000 MHz	4000 - 5000 MHz
Output Power (dBm)	+7	+5 Min.
Power Flatness (dB)	±1.0	±2.0 Max.
Tuning Voltage Range (v)	1 to 15	0 to 20
Tuning Voltage Sensitivity (MHz/V)	85	30 Min.
Harmonics (dBc)	-20	-10 Max.
Spurious (dBc)	<-80	-80 Max.
3dB Modulation BW, Zg = 50 Ohm	---	20 Min.
Pushing (MHz/V)	10	20 Max.
Pulling (MHz); 22dB RL	20	30 Max.
Frequency Drift (MHz/°C)	---	- 0.5 Max.
Power Vdc	+15	+15
mA	25	30 Max.

Maximum Ratings

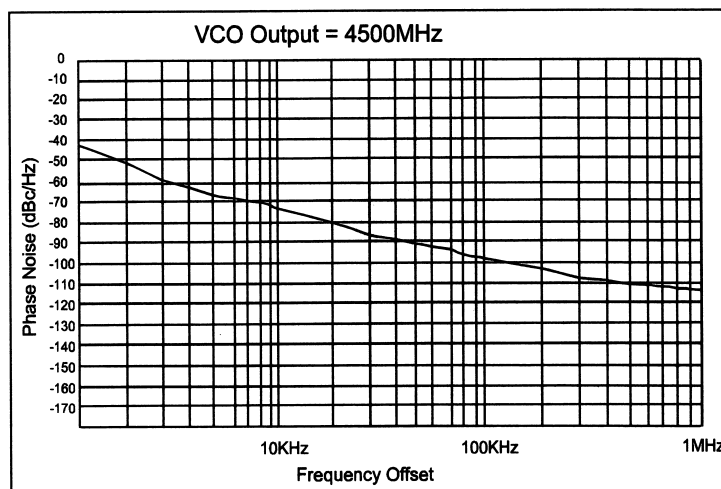
Ambient Operating Temperature -54°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - + 85 °C -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -90 dBc/Hz.

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04/11/02

VOLTAGE CONTROLLED OSCILLATOR

TOM9319

170-300 MHz

Available as:

TOM9319, 4 Pin TO-8 (T4)

TON9319, 4 Pin Surface Mount (SM3)

BXO9319, Connectorized Housing (H1)

Features

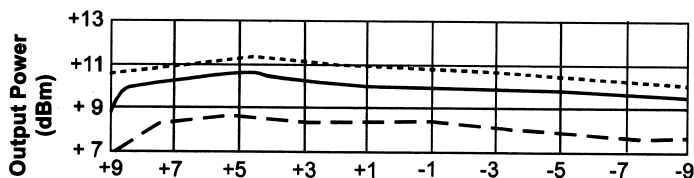
- Modulation Sensitivity Ratio: 1.7:1 Typical
- 3 dB Modulation Bandwidth: 4 MHz (50 ohm source)
- Operating Case Temp. -55 °C to + 100 °C
- Screening to the tables of MIL-STD-883 available

Specifications

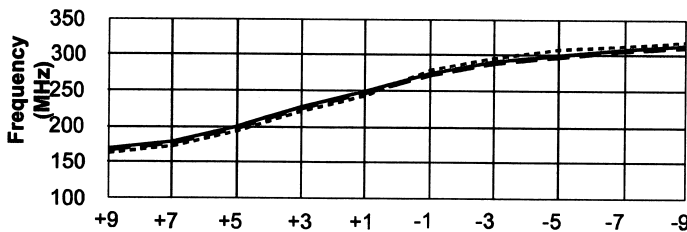
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -55°C to +100 °C
Frequency	170 - 300 MHz	170-300 MHz
Output Power (dBm)	+10.0	+8.0 Min.
Power Flatness (dBm)	±0.5	±1.0 Max.
Tuning Voltage Range (V)	+8 to -4	+9 to -9
Tuning Voltage Sensitivity (MHz/V)	10.0	5.0 Min.
Harmonics (dBc)	-15	-8 Max.
Spurious (dBc)	<-70	-70 Max.
Phase Noise @10 KHz @ 100 KHz (dBc/Hz)	-78 -108	-75 -105 Max.
Pushing (MHz/V)	2.0	4.0 Max.
Pulling (MHz); 12 dB RL	4.0	8.0 Max.
Frequency Drift (MHz/°C)	0.05	0.05 Max.
Power Vdc mA	+12 34.0	+12 45.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Tuning Voltage (Volts)



Tuning Voltage (Volts)

Legend ——— + 25 °C - - - - +100 °C - - - - -55 °C

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage -11 Volt

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
+11	136.0		+ 5.5	-18	-23
+10	152.0	16.0	+ 7.2	-19	-20
+9	162.8	10.8	+ 8.4	-20	-17
+8	171.0	8.2	+ 9.8	-21	-15
+7	179.5	8.5	+10.0	-22	-14
+6	188.4	8.9	+10.2	-21	-14
+5	200.6	12.2	+10.3	-18	-14
+4	213.7	13.1	+10.3	-18	-14
+3	227.0	13.3	+10.3	-17	-14
+2	239.2	12.2	+10.2	-18	-14
+1	250.9	11.7	+10.0	-20	-14
0	261.7	10.8	+ 9.8	-21	-14
-1	271.4	9.7	+ 9.9	-23	-14
-2	279.7	8.3	+ 9.8	-24	-14
-3	287.2	7.5	+ 9.7	-26	-14
-4	293.6	6.4	+ 9.6	-26	-14
-5	299.2	5.6	+ 9.5	-27	-14
-6	304.2	5.0	+ 9.5	-27	-14
-7	308.8	4.6	+ 9.4	-24	-15
-8	312.8	4.0	+ 9.4	-24	-15
-9	316.2	3.4	+ 9.4	-23	-15
-10	319.1	2.9	+ 9.4	-23	-14
-11	321.4	2.3	+ 9.4	-23	-14

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2/25/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9320

1700-2300 MHz

Available as:

TOM9320, 4 Pin TO-8 (T4)
TON9320, 4 Pin Surface Mount (SM3)
BXO9320, Connectorized Housing (H1)

Features

- Medium Output Power: +12.5 dBm Typical
- Operating Case Temp. 0 °C to + 65 °C
- Environmental Screening Available

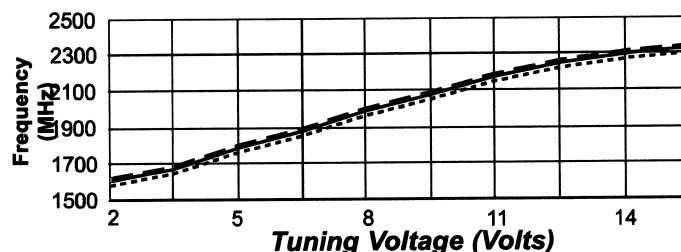
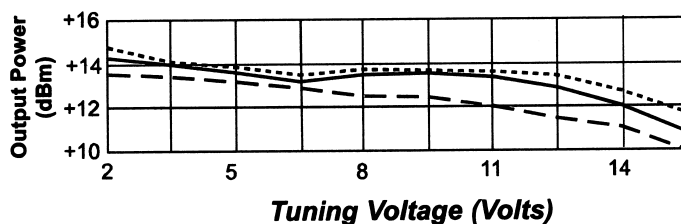
Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = 0°C to +65 °C
Frequency	1700 - 2300 MHz	1700 - 2300 MHz
Output Power (dBm)	+12.5	+10.0 Min.
Power Flatness (dBm)	±1.0	±1.5 Max.
Tuning Voltage Range (V)	4 to 14	3 to 15
Tuning Voltage Sensitivity (MHz/V)	60.0	40.0 Min.
Harmonics (dBc)	-20	-15 Max.
Spurious (dBc)	<-60	-60 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	5.0	9.0 Max.
Pulling (MHz); 12 dB RL	50	65 Max.
Frequency Drift (MHz/°C)	0.15	0.30 Max.
Power Vdc	+15	+15
mA	45.0	50.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
2.00	1584.2		+14.5	-25	-35
3.00	1657.8	73.6	+14.1	-31	-32
4.00	1729.6	71.8	+13.6	-33	-28
5.00	1796.2	66.7	+13.5	-42	-25
6.00	1861.5	65.3	+13.5	-45	-23
7.00	1924.2	62.6	+13.5	-37	-20
8.00	1982.3	58.1	+13.4	-35	-19
9.00	2038.2	55.9	+13.5	-32	-22
10.00	2091.1	53.0	+13.9	-33	-25
11.00	2141.7	50.6	+13.7	-32	-28
12.00	2191.7	50.0	+13.3	-33	-29
13.00	2241.9	50.2	+13.0	-35	-26
14.00	2291.7	49.8	+12.6	-37	-27
15.00	2342.0	50.3	+11.7	-48	-51

Legend ——— + 25 °C - - - - +65 °C - - - - 0 °C

Amplifonix

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VOLTAGE CONTROLLED OSCILLATOR

TOM9321

400-500 MHz

Available as:

TOM9321, 4 Pin TO-8 (T4)

TOM9321, 4 Pin Surface Mount (SM3)

BXO9321, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -40 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -40°C to +85 °C
Frequency	400 - 500 MHz	400 - 500 MHz
Output Power (dBm)	+15.0	+11.0 Min.
Power Flatness (dBm)	±0.5	±1.0 Max.
Tuning Voltage Range (V)	0 to 8	0 to 8
Tuning Voltage Sensitivity (MHz/V)	10 to 25	9 to 25
Harmonics (dBc)	-20	-11 Max.
Spurious (dBc)	<-60	-60 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-110	-107 Max.
Pushing (MHz/V)	0.5	1.0 Max.
Pulling (MHz); 12 dB RL	3	6 Max.
Frequency Drift (MHz/°C)	—	-0.15 Max.
Power Vdc	+15	+15
mA	25.0	30.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

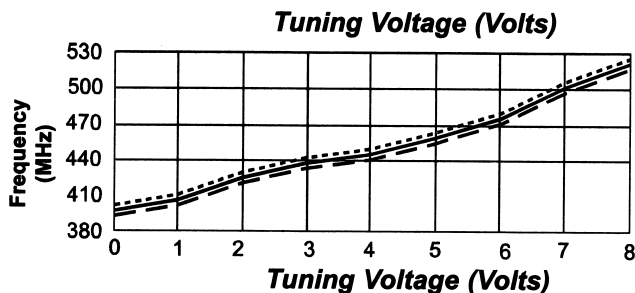
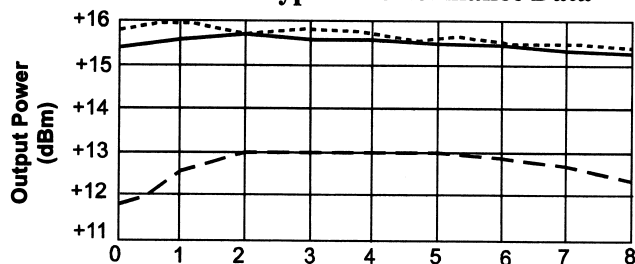
Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volt

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	394.0		+15.39	-24.45	-21.52
1.00	409.6	15.6	+15.65	-25.12	-22.44
2.00	420.8	11.3	+15.71	-24.88	-21.73
3.00	431.6	10.8	+15.60	-24.50	-20.94
4.00	443.4	11.8	+15.59	-24.36	-21.13
5.00	458.3	14.9	+15.49	-24.32	-21.83
6.00	477.6	19.3	+15.53	-24.82	-22.59
7.00	500.2	22.6	+15.35	-25.21	-23.19
8.00	523.0	22.8	+15.23	-26.28	-25.06

Legend ——— + 25 °C - - - - +85 °C - - - - -40 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

2/25/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9323

200-250 MHz

Available as:

TOM9323, 4 Pin TO-8 (T4)
TON9323, 4 Pin Surface Mount (SM3)
BXO9323, Connectorized Housing (H1)

Features

- Center Frequency: 225 MHz @ 8 Tuning Volts Typical
- Low Noise Bipolar Transistor
- Operating Case Temp. 0 °C to + 70 °C
- Screening to the tables of MIL-STD-883 available

Specifications

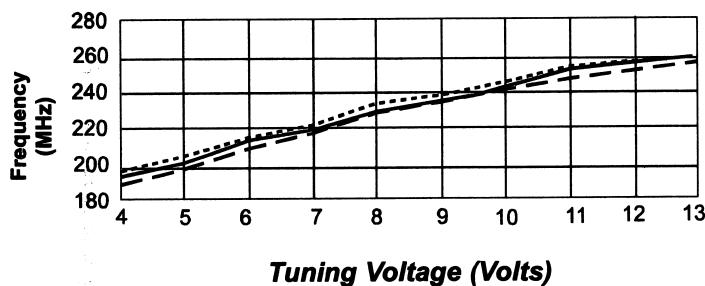
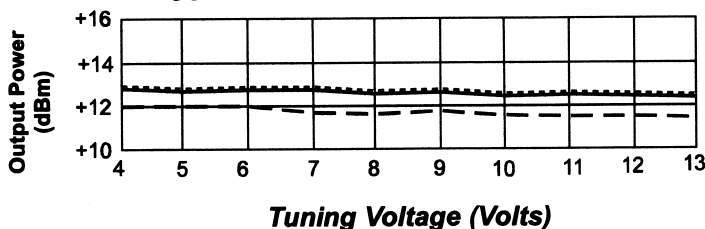
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = 0°C to +70 °C
Frequency	200 - 250 MHz	200 - 250 MHz
Output Power (dBm)	+13.0	+10.0 Min.
Power Flatness (dBm)	±0.2	±0.5 Max.
Tuning Voltage Range (V)	4 to 13	4 to 13
Tuning Voltage Sensitivity (MHz/V)	7.0	4.0 Min.
Harmonics (dBc)	-15	-10 Max.
Spurious (dBc)	<-80	-60 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-120	-110 Max.
Pushing (MHz/V)	0.5	2.0 Max.
Pulling (MHz); 12 dB RL	5.0	10.0 Max.
Frequency Drift (MHz/°C)	0.05	0.10 Max.
Power Vdc	+10	+10
mA	14.0	16.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volt

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
4.0	193.9		+12.8	-15	-16
5.0	202.9	9.0	+12.7	-15	-16
6.0	211.1	8.2	+12.6	-15	-16
7.0	218.6	7.5	+12.6	-15	-17
8.0	225.7	7.1	+12.6	-15	-17
9.0	232.8	7.1	+12.6	-15	-17
10.0	239.3	6.5	+12.3	-16	-18
11.0	245.4	6.1	+12.4	-15	-19
12.0	251.2	5.8	+12.4	-15	-19
13.0	256.4	5.2	+12.4	-15	-19

Legend ——— + 25 °C - - - - +70 °C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9324

2200-2500 MHz

Available as:
TOM9324, 4 Pin TO-8 (T4)
TON9324, 4 Pin Surface Mount (SM3)
BXO9324, Connectorized Housing (H1)

Features

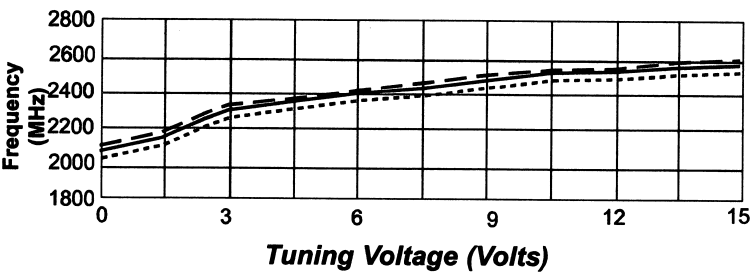
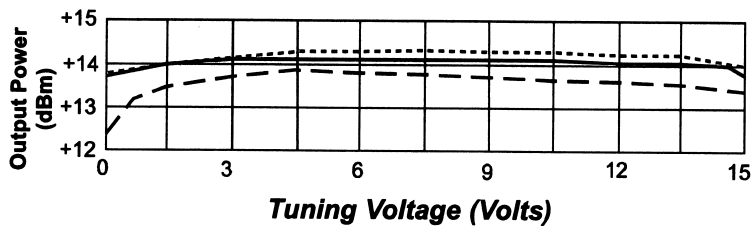
- Low Frequency Drift
- Operating Case Temp. -54 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -54°C to +85 °C
Frequency	2200 - 2500 MHz	2200 - 2500 MHz
Output Power (dBm)	+14.0	+12.5 Min.
Power Flatness (dBm)	±0.25	±0.5 Max.
Tuning Voltage Range (V)	2 to 11	1 to 13
Tuning Voltage Sensitivity (MHz/V)	30.0	15.0 Min.
Harmonics (dBc)	-25	-20 Max.
Spurious (dBc)	<-80	<- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	4.0	7.0 Max.
Pulling (MHz); 24 dB RL	30.0	35.0 Max.
Frequency Drift (MHz/°C)	± 0.05	±0.2 Max.
Power Vdc	+15	+15
mA	27.0	30.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

V _t (V)	f _o (MHz)	Df (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	2109.2		+13.8	-29	-56
1.00	2160.8	51.6	+14.2	-28	-53
2.00	2204.6	43.8	+14.0	-27	-52
3.00	2250.4	45.8	+14.2	-25	-49
4.00	2294.6	44.2	+14.3	-25	-47
5.00	2337.5	42.9	+14.3	-25	-46
6.00	2376.9	39.4	+14.3	-25	-50
7.00	2412.0	35.1	+14.3	-25	-49
8.00	2441.9	29.9	+14.2	-25	-50
9.00	2467.0	25.1	+14.2	-25	-46
10.00	2488.5	21.5	+14.1	-25	-48
11.00	2507.0	18.5	+14.1	-25	-48
12.00	2523.1	16.1	+14.1	-25	-44
13.00	2537.0	13.9	+14.0	-25	-43
14.00	2549.3	12.3	+14.0	-25	-43
15.00	2560.2	10.9	+13.9	-25	-43

Legend ——— + 25 °C - - - - +85 °C - - - - -54 °C



2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9325

2200-2700 MHz

Available as:

TOM9325, 4 Pin TO-8 (T4)

TON9325, 4 Pin Surface Mount (SM3)

BXO9325, Connectorized Housing (H1)

Features

- Tuning Variation: 2.2:1 Maximum
- Operating Case Temp. 0 °C to + 50 °C
- Screening to the tables of MIL-STD-883 available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = 0°C to +50 °C
Frequency	2200 - 2700 MHz	2200 - 2700 MHz
Output Power (dBm)	+12.0	+10.0 Min.
Power Flatness (dBm)	±0.5	±1.0 Max.
Tuning Voltage Range (V)	2 to 8	1.5 to 10
Tuning Voltage Sensitivity (MHz/V)	80.0	50.0 Min.
Harmonics (dBc)	-18	-12 Max.
Spurious (dBc)	<- 50	- 50 Max.
Phase Noise @10 KHz	- 80	- 75 Max.
@ 100 KHz (dBc/Hz)	-105	-100
Pushing (MHz/V)	3.0	7.0 Max.
Pulling (MHz); 20 dB RL	28.0	35.0 Max.
Frequency Drift (MHz/°C)	0.8	1.2 Max.
Power Vdc	+12	+12
mA	33.0	40.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

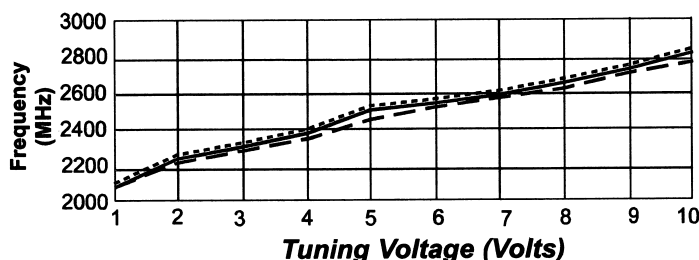
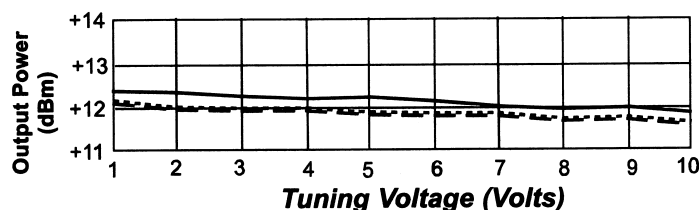
Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volts



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
1.5	2160.2		+12.5	-24	-44
2.0	2214.8	54.6	+12.5	-34	-41
3.0	2310.0	95.2	+12.3	-22	-46
4.0	2404.2	94.2	+12.3	-17	-39
5.0	2494.2	90.0	+12.2	-16	-36
6.0	2564.4	70.2	+12.2	-21	-37
7.0	2635.0	70.6	+12.1	-17	-35
8.0	2699.3	64.3	+12.1	-14	-35
9.0	2755.3	56.0	+12.1	-13	-33
10.0	2802.2	46.9	+12.0	-13	-33

Legend ——— + 25 °C - - - - +50 °C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9326

2255-2280 MHz

Available as:

TOM9326, 4 Pin TO-8 (T4)

TON9326, 4 Pin Surface Mount (SM3)

BXO9326, Connectorized Housing (H1)

Features

- Low Tuning Voltage Sensitivity
- Operating Case Temp. 0 °C to + 50 °C
- Screening to the tables of MIL-STD-883 available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = 0°C to +50 °C
Frequency	2255 - 2280 MHz	2255 - 2280 MHz
Output Power (dBm)	+6.0	+4.5 Min.
Power Flatness (dBm)	±0.25	±0.5 Max.
Tuning Voltage Range (V)	0.5 to 4.5	0.5 to 4.5
Tuning Voltage Sensitivity (MHz/V)	7.0	5.0 Min.
Harmonics (dBc)	-24	-20 Max.
Spurious (dBc)	<- 80	- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	6.0	9.0 Max.
Pulling (MHz); 12 dB RL	30.0	40.0 Max.
Frequency Drift (MHz/°C)	0.08	0.17 Max.
Power Vdc mA	+5 20.0	+5 23.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

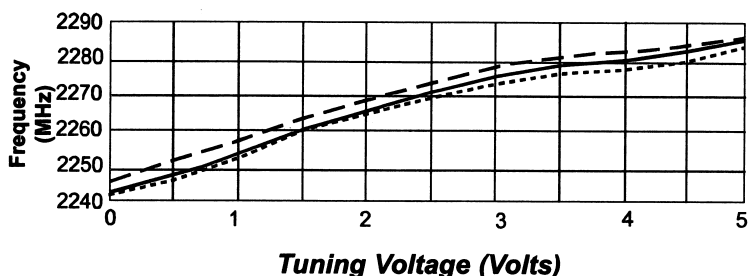
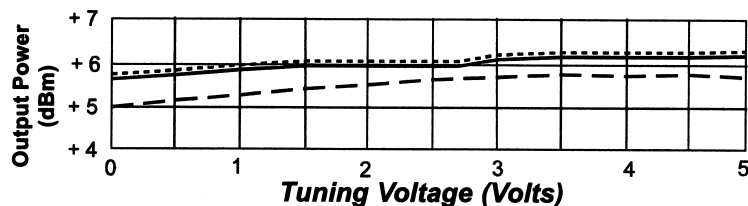
Case Temperature + 125 °C

DC Voltage + 10 Volts

Maximum DC Tuning Voltage + 15 Volts

Minimum DC Tuning Voltage 0 Volts

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.0	2241.9		+5.7	-27	-37
0.5	2250.1	16.4	+5.8	-25	-38
1.0	2256.5	12.8	+5.9	-26	-38
1.5	2261.8	10.6	+5.9	-25	-38
2.0	2266.5	9.4	+6.0	-25	-37
2.5	2270.8	8.6	+6.0	-25	-37
3.0	2274.8	8.0	+6.0	-24	-38
3.5	2278.5	7.4	+6.0	-23	-38
4.0	2281.8	6.6	+6.1	-23	-38
4.5	2285.0	6.4	+6.1	-23	-38
5.0	2288.0	6.0	+6.1	-23	-38

Legend ——— + 25 °C - - - - +50 °C - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9327

2200-2300 MHz

Available as:

TOM9327, 4 Pin TO-8 (T4)
TON9327, 4 Pin Surface Mount (SM3)
BXO9327, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Linear Tuning
- Operating Case Temp. -30 °C to +55 °C
- Environmental Screening Available

Specifications

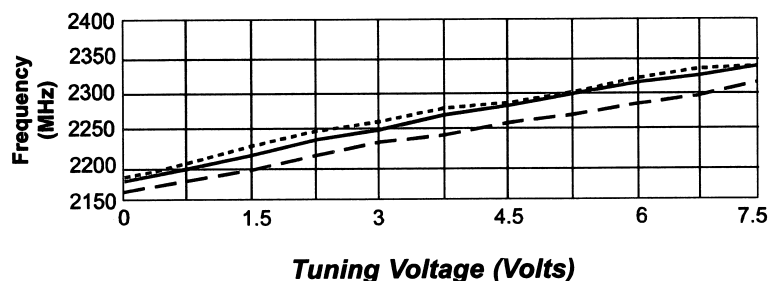
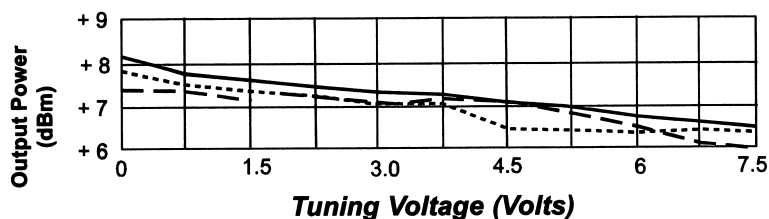
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -30°C to +55 °C
Frequency	2200 - 2300 MHz	2200 - 2300 MHz
Output Power (dBm)	+7.0	+5.0 Min.
Power Flatness (dBm)	±0.75	±1.0 Max.
Tuning Voltage Range (V)	1.0 to 6.0	0.0 to 7.5
Tuning Voltage Sensitivity (MHz/V)	25.0	15.0 Min.
Harmonics (dBc)	-30	-20 Max.
Spurious (dBc)	<- 80	<- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	5.0	9.0 Max.
Pulling (MHz); 12 dB RL	40.0	55.0 Max.
Frequency Drift (MHz/°C)	-0.35	-1.0 Max.
Power Vdc	+5	+5
mA	27.0	30.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 15 Volts
Minimum DC Tuning Voltage 0 Volts

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



V _t (V)	f _o (MHz)	Df (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	2174.1		+8.16	-27.42	-47.99
0.50	2188.9	29.5	+7.96	-27.40	-46.30
1.00	2204.4	31.0	+7.84	-27.51	-45.04
1.50	2215.5	22.2	+7.73	-27.61	-45.67
2.00	2226.3	21.5	+7.61	-27.73	-43.75
2.50	2236.4	20.3	+7.51	-27.97	-43.75
3.00	2246.8	20.7	+7.42	-28.23	-41.77
3.50	2257.4	21.3	+7.29	-28.25	-42.60
4.00	2269.9	25.0	+7.24	-28.32	-43.13
4.50	2279.4	19.0	+7.07	-28.48	-43.07
5.00	2289.9	21.0	+7.04	-29.09	-43.61
5.50	2300.0	20.2	+6.86	-29.32	-45.22
6.00	2310.0	20.0	+6.86	-29.97	-45.42
6.50	2320.9	21.8	+6.79	-30.81	-44.75
7.00	2329.6	17.5	+6.77	-31.03	-46.37
7.50	2337.8	16.2	+6.67	-31.46	-47.62

Legend ——— + 25 °C - - - - +55 °C - - - - -30 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9328

800-1300 MHz

Available as:

TOM9328, 4 Pin TO-8 (T4)

TON9328, 4 Pin Surface Mount (SM3)

BXO9328, Connectorized Housing (H1)

Features

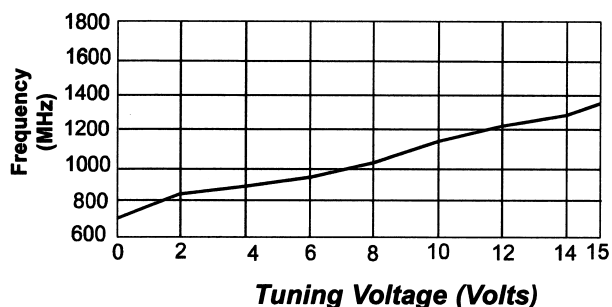
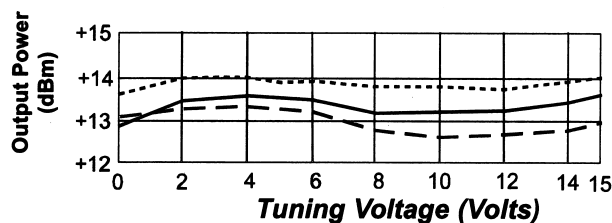
- Broad Tuning Range
- Low Noise Bipolar Transistor
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -55°C to +85 °C
Frequency	800 - 1300 MHz	800 - 1300 MHz
Output Power (dBm)	+13.0	+10.0 Min.
Power Flatness (dBm)	±0.5	±1.0 Max.
Tuning Voltage Range (V)	1.0 to 14.0	0.0 to 15.0
Tuning Voltage Sensitivity (MHz/V)	>38.0	30.0 Min.
Harmonics (dBc)	-20	-10 Max.
Spurious (dBc)	<- 80	- 60 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-116	-112 Max.
Pushing (MHz/V)	2.0	4.0 Max.
Pulling (MHz); 20 dB RL	6.0	12.0 Max.
Frequency Drift (MHz/°C)	—	0.15 Max.
Power Vdc	+15	+15
mA	22.0	25.0 Max.

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 20 Volts
 Maximum DC Tuning Voltage + 20 Volts
 Minimum DC Tuning Voltage 0 Volts

V _t (V)	f _o (MHz)	Df (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	701.67	0.00	+12.97	-11.68	- 8.92
1.00	771.16	69.49	+13.24	-14.30	-11.33
2.00	812.90	41.74	+13.40	-18.92	-13.13
3.00	846.02	33.12	+13.42	-24.51	-14.04
4.00	876.77	30.75	+13.36	-33.27	-14.65
5.00	909.26	32.49	+13.44	-32.15	-15.57
6.00	946.63	37.37	+13.43	-24.80	-16.47
7.00	988.75	42.12	+13.43	-20.85	-17.76
8.00	1035.62	46.87	+13.29	-19.11	-18.84
9.00	1086.36	50.74	+13.22	-18.74	-20.80
10.00	1136.35	49.99	+13.22	-18.75	-21.68
11.00	1184.22	47.87	+13.19	-18.82	-22.23
12.00	1228.47	44.25	+13.24	-19.56	-23.06
13.00	1267.46	38.99	+13.39	-20.37	-23.85
14.00	1301.58	34.12	+14.47	-20.69	-25.19
15.00	1331.58	30.00	+13.68	-21.03	-25.91

Legend ——— + 25 °C - - - - +85 °C - - - - -55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001

03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9329

1875-1975 MHz

Available as:

TOM9329, 4 Pin TO-8 (T4)
TON9329, 4 Pin Surface Mount (SM3)
BXO9329, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Linear Tuning
- Operating Case Temp. -30 °C to + 55 °C
- Environmental Screening Available

Specifications

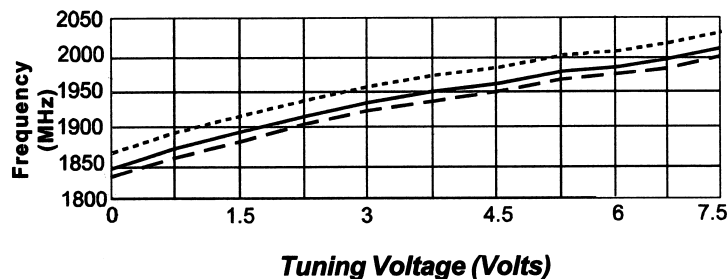
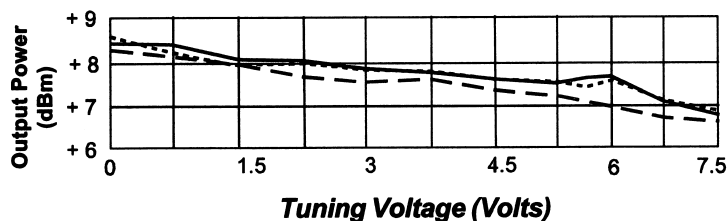
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -30°C to +55 °C
Frequency	1875 - 1975 MHz	1875 - 1975 MHz
Output Power (dBm)	+7.0	+5.0 Min.
Power Flatness (dBm)	±0.5	±0.75 Max.
Tuning Voltage Range (V)	0.5 to 5.5	0.0 to 7.5
Tuning Voltage Sensitivity (MHz/V)	25.0	15.0 Min.
Harmonics (dBc)	-30	-20 Max.
Spurious (dBc)	<- 80	<- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	6.0	9.0 Max.
Pulling (MHz); 12 dB RL	40.0	55.0 Max.
Frequency Drift (MHz/°C)	-0.35	-0.50 Max.
Power Vdc	+5	+5
mA	24.0	30.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 15 Volts
Minimum DC Tuning Voltage 0 Volts

NOTE: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	1851.9		+8.49	-28.96	-33.91
0.50	1868.4	33.0	+8.45	-29.45	-33.52
1.00	1883.0	29.2	+8.31	-30.63	-34.13
1.50	1895.6	25.3	+8.12	-32.05	-34.59
2.00	1907.3	23.2	+8.08	-32.79	-33.97
2.50	1918.6	22.8	+7.95	-33.32	-34.35
3.00	1929.0	20.7	+7.82	-34.06	-35.94
3.50	1939.0	20.0	+7.82	-34.93	-37.88
4.00	1948.6	19.3	+7.64	-36.10	-38.50
4.50	1958.1	19.0	+7.55	-37.23	-37.58
5.00	1967.6	19.0	+7.47	-38.03	-38.80
5.50	1976.6	18.0	+7.46	-38.65	-39.44
6.00	1985.8	18.2	+7.32	-39.38	-38.47
6.50	1995.3	19.0	+7.15	-39.36	-38.83
7.00	2004.3	18.0	+7.02	-40.15	-38.87
7.50	2013.8	19.0	+6.93	-40.70	-38.52

Legend ——— + 25 °C - - - - +55 °C - - - - -30 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001

VOLTAGE CONTROLLED OSCILLATOR

TOM9330

1700 - 2700 MHz

Available as:

TOM9330, 4 Pin TO-8 (T4)

TON9330, 4 Pin Surface Mount (SM3)

BXO9330, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Operating Case Temp. 0 °C to + 70 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = 0 °C to +70 °C
Frequency	1700 - 2700 MHz	1700 - 2700 MHz
Output Power (dBm)	+12	+10.0 Min.
Power Flatness (dBm)	±1.5	±1.5 Max.
Tuning Voltage Range (V)	3 to 17	0 to 20
Tuning Voltage Sensitivity (MHz/V)	80	30 Min.
Harmonics (dBc)	- 20	- 14 Max.
Spurious (dBc)	<-80	- 80 Max.
Phase Noise @ 100 KHz (dBc/hz)	- 101	- 95 Max.
Pushing (MHz/V)	5.0	10.0 Max.
Pulling (MHz); 22 dB RL	30	45 Max.
Frequency Drift (MHz/°C)	—	0.5 Max.
Power Vdc	+15	+15
mA	19	20.0

NOTE: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

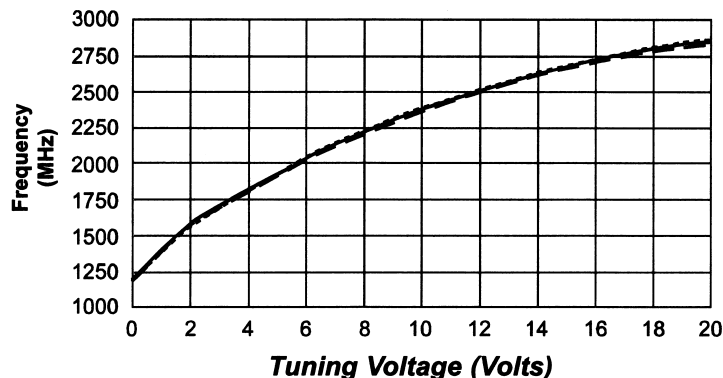
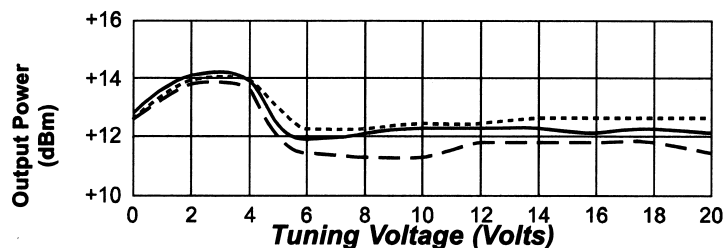
Case Temperature + 125 °C

DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 22 Volts

Minimum DC Tuning Voltage 0 Volts

Typical Performance Data



Legend ——— + 25 °C - - - - - +70 °C - - - - - 0 °C

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	1198.0		+12.8	-18.3	-11.8
1.00	1409.7	211.7	+13.9	-22.2	-16.3
2.00	1582.6	172.9	+14.1	-21.8	-19.5
3.00	1713.3	130.7	+13.9	-17.5	-21.8
4.00	1817.4	104.2	+13.9	-17.0	-25.0
5.00	1931.3	113.8	+12.9	21.2	-33.2
6.00	2041.8	110.5	+11.9	-37.8	-27.0
7.00	2135.4	93.7	+12.1	-30.7	-26.8
8.00	2220.7	85.3	+12.1	-27.0	-24.2
9.00	2301.5	80.8	+12.1	-25.7	-25.1
10.00	2378.3	76.8	+12.3	-25.3	-25.5
11.00	2449.2	70.8	+12.4	25.8	-26.5
12.00	2515.4	66.3	+12.3	26.2	-27.4
13.00	2576.9	61.5	+12.3	26.7	-29.3
14.00	2633.4	56.5	+12.3	27.2	-32.2
15.00	2684.7	51.3	+12.4	27.8	-32.0
16.00	2730.6	45.9	+12.1	28.3	-31.6
17.00	2770.4	39.8	+12.3	29.3	-32.0
18.00	2803.8	33.3	+12.3	29.5	-31.7
19.00	2829.9	26.2	+12.1	29.7	-33.1
20.00	2849.4	19.5	+12.1	30.2	-33.2

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9331

1725-1790 MHz

Available as:

TOM9331, 4 Pin TO-8 (T4)
TON9331, 4 Pin Surface Mount (SM3)
BXO9331, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Linear Tuning
- Operating Case Temp. -35 °C to + 60 °C
- Environmental Screening Available

Specifications

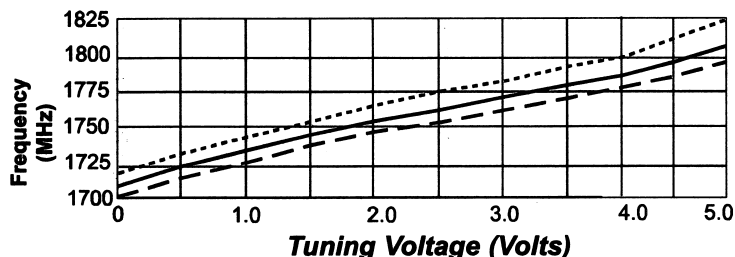
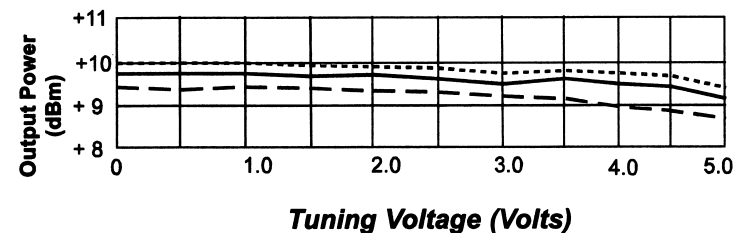
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -35°C to +60 °C
Frequency	1725 - 1790 MHz	1725 - 1790 MHz
Output Power (dBm)	+9.5	+8.0 Min.
Power Flatness (dBm)	±0.5	±0.75 Max.
Tuning Voltage Range (V)	0.5 to 4.5	0.0 to 5.0
Tuning Voltage Sensitivity (MHz/V)	20.0	15.0 Min.
Harmonics (dBc)	-30	-20 Max.
Spurious (dBc)	<- 80	<- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-104	-100 Max.
Pushing (MHz/V)	6.0	9.0 Max.
Pulling (MHz); 12 dB RL	40.0	55.0 Max.
Frequency Drift (MHz/°C)	-0.35	-0.50 Max.
Power Vdc	+5	+5
mA	30.0	35.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 15 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	1707.0		+9.79	-31.5	-37.9
0.50	1718.3	22.5	+9.80	-30.9	-39.8
1.00	1730.1	23.8	+9.81	-30.7	-36.8
1.50	1741.5	22.7	+9.72	-30.5	-33.9
2.00	1751.5	20.0	+9.70	-30.3	-36.6
2.50	1762.1	21.3	+9.64	-30.4	-32.7
3.00	1770.6	17.0	+9.48	-29.7	-33.4
3.50	1779.4	17.5	+9.51	-29.8	-32.4
4.00	1788.1	17.5	+9.35	-29.5	-31.8
4.50	1797.3	18.2	+9.29	-29.8	-32.5
5.00	1806.0	17.5	+9.17	-29.7	-31.7

Legend ——— + 25 °C - - - - +60 °C - - - - -35 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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2/26/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9332

1400 - 1800 MHz

Available as:

TOM9332, 4 Pin TO-8 (T4)

TON9332, 4 Pin Surface Mount (SM3)

BXO9332, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 95 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +95 °C
Frequency	1400 - 1800 MHz	1400 - 1800 MHz
Output Power (dBm)	>+12	+10.0 Min.
Power Flatness (dBm)	±1.0	±1.5 Max.
Tuning Voltage Range (V)	1.5 to 8	0 to 15
Tuning Voltage Sensitivity (MHz/V)	<125	40 Min.
Harmonics (dBc)	<-18	-10 Max.
Spurious (dBc)	<-80	- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-108	-100 Max.
Pushing (MHz/V)	<2	3.0 Max.
Pulling (MHz); 22 dB RL	21	30.0 Max.
Frequency Drift (MHz/°C)	—	0.2 Max.
Power Vdc	+15	+15
mA	20	24.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

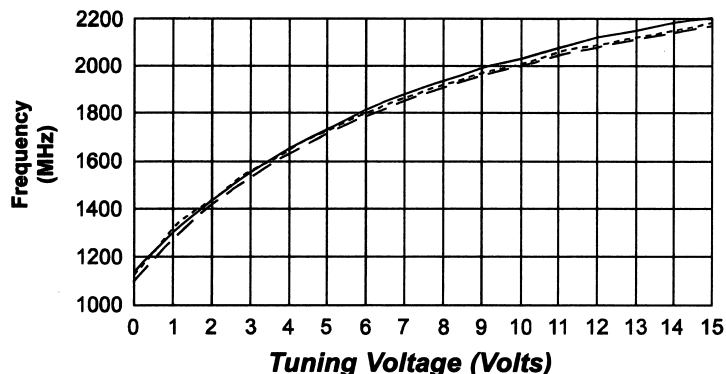
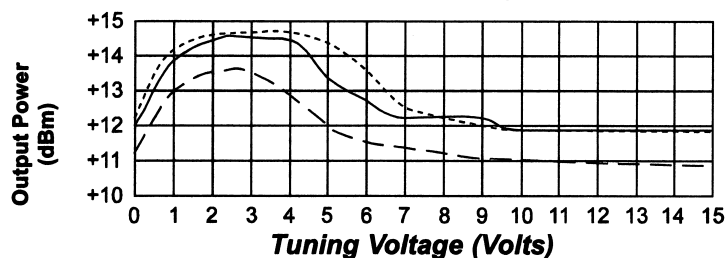
DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volt

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ----- + 25 °C - - - - +95 °C - - - - -55°C

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.0	1135.4		+12.0	- 8.8	-19.5
1.00	1300.8	165.4	+13.9	-14.2	-17.8
2.00	1437.2	136.3	+14.4	-19.0	-19.5
3.00	1554.5	117.3	+14.5	-19.3	-22.8
4.00	1650.1	95.6	+14.2	-18.0	-26.2
5.00	1733.3	83.3	+13.4	-19.2	-33.5
6.00	1813.4	80.1	+12.7	-22.8	-32.5
7.00	1880.3	66.9	+12.2	-27.7	-30.2
8.00	1939.3	58.9	+12.2	-34.2	-28.8
9.00	1991.8	52.6	+12.2	-36.0	-29.0
10.00	2038.3	46.5	+11.9	-32.0	-29.3
11.00	2079.8	41.5	+11.9	-30.3	-29.3
12.00	2118.6	38.8	+12.2	-29.3	-30.2
13.00	2152.4	33.8	+12.0	-28.5	-30.5
14.00	2183.1	30.7	+11.9	-27.5	<-30
15.00	2208.9	25.8	+11.7	-27.0	<-30

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001 03/06/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9334

1000 - 1600 MHz

Available as:

TOM9334, 4 Pin TO-8 (T4)
TON9334, 4 Pin Surface Mount (SM3)
BXO9334, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -45 °C to +85 °C
- Environmental Screening to MIL-STD- 883

Specifications

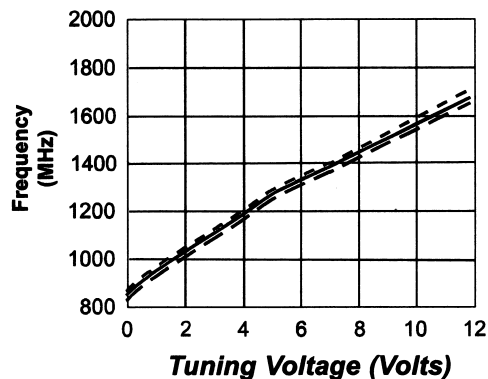
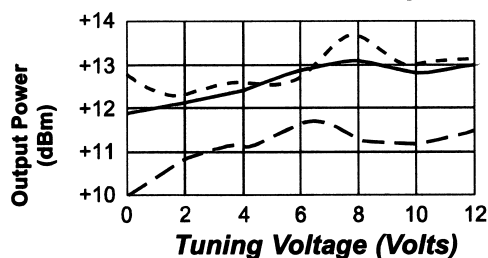
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -45°C to +85 °C
Frequency	1000 - 1600 MHz	1000 - 1600 MHz
Output Power (dBm)	+12.5	+10.0 Min.
Power Flatness (dBm)	±0.7	±1.0 Max.
Tuning Voltage Range (V)	1 to 11	1 to 11
Tuning Voltage Sensitivity (MHz/V)	60	40 Min.
Harmonics (dBc)	-20	-12 Max.
Spurious (dBc)	<-80	- 80 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-113	-102 Max.
Pushing (MHz/V)	<2.5	5.0 Max.
Pulling (MHz); 20 dB RL	20	25 Max.
Frequency Drift (MHz/°C)	—	0.2 Max.
Power Vdc	+15	+15
mA	19	20.0

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 22 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C ······ -45 °C

V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	885.1		+11.9	-19.0	-19.0
1.00	986.9	101.9	+12.1	-23.3	-18.2
2.00	1084.0	97.1	+12.1	-25.5	-19.2
3.00	1162.1	78.1	+12.1	-24.0	-20.5
4.00	1232.0	69.9	+12.3	-22.5	-22.3
5.00	1297.6	65.6	+12.4	-22.5	-24.5
6.00	1358.2	60.6	+12.9	-22.8	-26.5
7.00	1414.3	56.1	+13.1	-22.5	-29.2
8.00	1469.2	54.9	+13.1	-21.3	-33.0
9.00	1526.4	57.2	+12.9	-19.7	-36.7
10.00	1579.7	53.4	+12.6	-19.7	-39.2
11.00	1628.9	49.2	+12.8	-19.5	-38.8

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001 3/25/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9335

750-940 MHz

Available as:

TOM9335, 4 Pin TO-8 (T4)
TON9335, 4 Pin Surface Mount (SM3)
BXO9335, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -40 °C to + 85 °C
- Environmental Screening Available

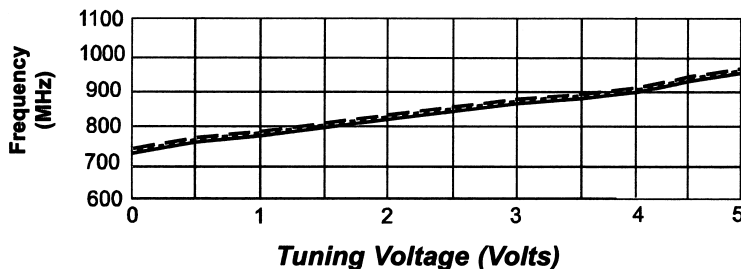
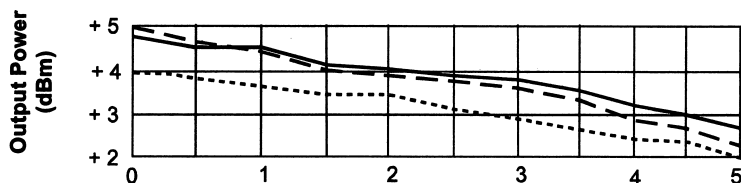
Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -40°C to +85 °C
Frequency	750 - 940 MHz	750 - 940 MHz
Output Power (dBm)	+3.0	+2.0 Min.
Power Flatness(dBm)	±1.0	±1.5 Max.
Tuning Voltage Range (v)	0.0 to 5.0	0.0 to 5.0
Tuning Voltage Sensitivity (MHz/V)	40.0	30 to 55 Min.
Harmonics (dBc)	-11	-10 Max.
Spurious (dBc)	<- 60	<- 60 Max.
Phase Noise @ 100 KHz (dBc/hz)	-102	-100 Max.
Pushing (MHz/V)	3.0	6.0 Max.
Pulling (MHz); 12 dB RL	25.0	35.0 Max.
Frequency Drift (MHz/ °C)	—	±0.25 Max.
Power Vdc	+5	+5
mA	8.0	10.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	737.3		+4.90	-11.8	-29.6
0.50	762.1	49.8	+4.55	-12.1	-30.0
1.00	782.6	41.0	+4.42	-12.4	-31.0
1.50	802.1	39.0	+4.11	-12.6	-31.2
2.00	821.1	38.0	+4.10	-13.0	-31.1
2.50	840.5	38.8	+3.93	-13.1	-30.2
3.00	861.1	41.2	+3.72	-13.5	-29.8
3.50	882.0	41.8	+3.48	-13.7	-29.2
4.00	903.6	43.2	+3.24	-14.1	-28.5
4.50	926.3	45.3	+3.00	-14.3	-28.9
5.00	949.8	47.0	+2.82	-14.7	-31.3

Legend ——— + 25 °C - - - - +85 °C - - - - -40 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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VOLTAGE CONTROLLED OSCILLATOR

TOM9336

385-415 MHz

Available as:

TOM9336, 4 Pin TO-8 (T4)
TON9336, 4 Pin Surface Mount (SM3)
BXO9336, Connectorized Housing (H1)

Features

- 5 Volt Operation
- Operating Case Temp. 0 °C to + 50 °C
- Environmental Screening Available

Specifications

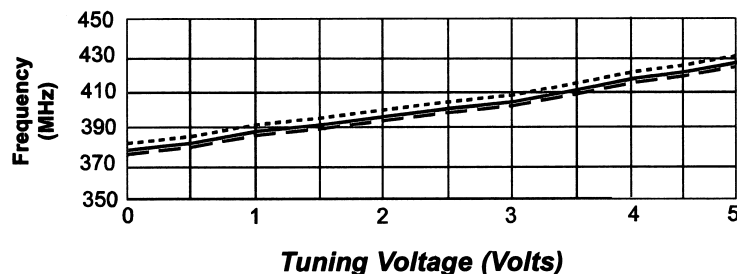
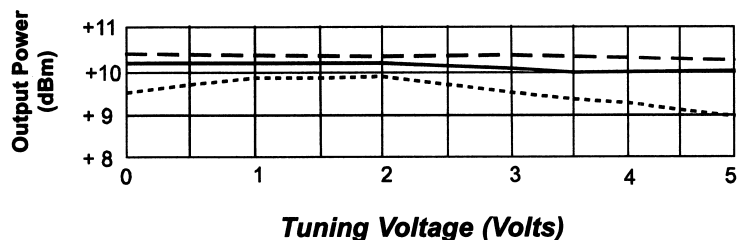
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = 0°C to +50 °C
Frequency	385 - 415 MHz	385 - 415 MHz
Output Power (dBm)	+10.0	+6.0 Min.
Power Flatness (dBm)	±0.25	±0.5 Max.
Tuning Voltage Range (V)	0.0 to 5.0	0.0 to 5.0
Tuning Voltage Sensitivity (MHz/V)	10.0	5.0 Min.
Harmonics (dBc)	- 7.0	-5.0 Max.
Spurious (dBc)	<- 60	<- 60 Max.
Phase Noise @ 100 KHz (dBc/Hz)	-100	- 90 Max.
Pushing (MHz/V)	3.0	8.0 Max.
Pulling (MHz); 12 dB RL	3.0	5.0 Max.
Frequency Drift (MHz/°C)	±.04	±.10 Max.
Power Vdc	+5	+5
mA	33.0	40.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 85 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 10 Volts
Maximum DC Tuning Voltage + 10 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



V _t (V)	f _o (MHz)	Δf (MHz)	P _o (dBm)	2H (dBc)	3H (dBc)
0.00	376.8		+10.3	-7.6	-20.5
1.00	384.8	8.0	+10.4	-7.8	-20.3
2.00	394.8	10.0	+10.5	-7.8	-22.0
3.00	405.7	10.9	+10.3	-7.7	-25.6
4.00	416.2	10.5	+10.1	-7.3	-21.9
5.00	426.8	10.6	+10.0	-7.3	-21.2

Legend ——— + 25 °C - - - - +50 °C - - - - - 0 °C

Amplifonix

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03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9338

180-220 MHz

Available as:

TOM9338, 4 Pin TO-8 (T4)

TON9338, 4 Pin Surface Mount (SM3)

BXO9338, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -40 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -40°C to +85 °C
Frequency	180 - 220 MHz	180 - 220 MHz
Output Power (dBm)	+17.5	+15.0 Min.
Power Flatness (dBm)	±0.25	±0.5 Max.
Tuning Voltage Range (V)	4.0 to 9.0	0.0 to 12.0
Tuning Voltage Sensitivity (MHz/V)	9.0	3.0 Min.
Harmonics (dBc)	20.0	10.0 Max.
3dB Modulation BW, Zg = 50 Ohms	-----	5 MHz Min.
Pushing (MHz/V)	0.5	2.0 Max.
Pulling (MHz); 14 dB RL	5.0	10.0 Max.
Frequency Drift (MHz/°C)	-----	.10 Max.
Power Vdc	+15	+15
mA	26.0	30.0 Max.

Maximum Ratings

Ambient Operating Temperature -40°C to + 85 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

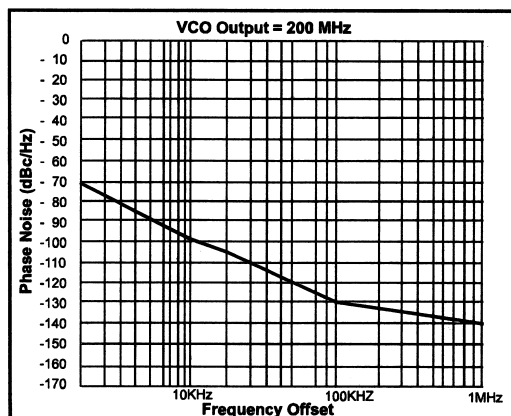
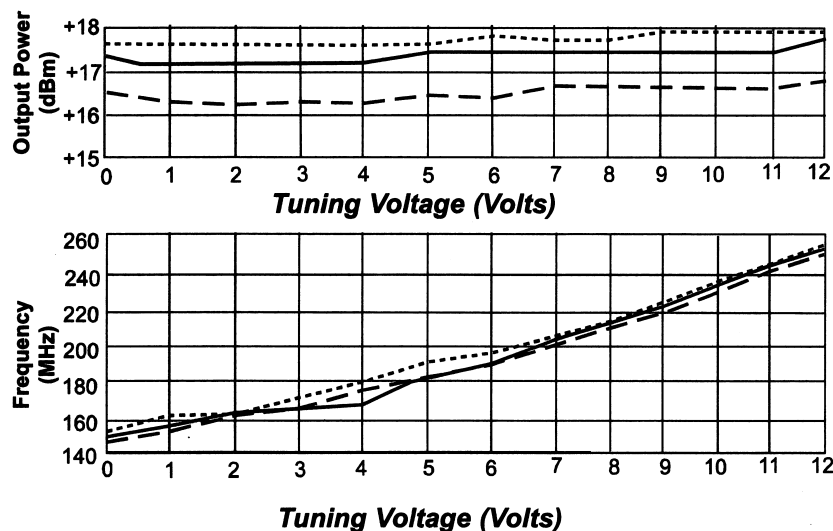
DC Voltage + 15 Volts

Maximum DC Tuning Voltage + 15 Volts

Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Notes:

1- Phase Noise is measured using the Aeroflex PN9000.

2- Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -120dBc/Hz

Legend ——— + 25 °C - - - - +50 °C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9339

3900-4100 MHz

Available as:

TOM9339, 4 Pin TO-8 (T4)
TON9339, 4 Pin Surface Mount (SM3)
BXO9339, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening Available

Specifications

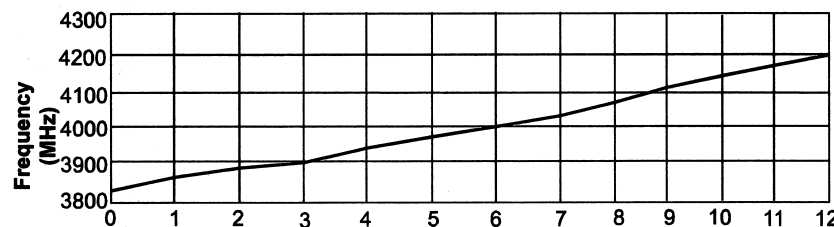
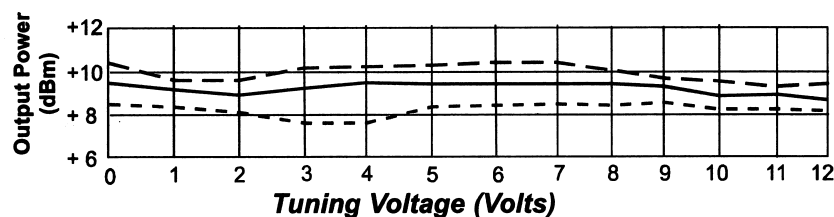
CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -40°C to +85 °C
Frequency	3900 - 4100 MHz	3900 - 4100 MHz
Output Power (dBm)	+ 9.5	+ 8.0 Min.
Power Flatness (dBm)	±0.25	±0.5 Max.
Tuning Voltage Range (V)	2.0 to 10.0	0.0 to 12.0
Tuning Voltage Sensitivity (MHz/V)	35.0	20.0 Min.
Harmonics (dBc)	-16.0	-12.0 Max.
Spurious (dBc)	< -80	< -60
3dB Modulation BW, Zg = 50 Ohms	-----	20MHz Max.
Pushing (MHz/V)	2.0	6.0 Max.
Pulling (MHz); 14 dB RL	14.0	20.0 Max.
Frequency Drift (MHz/°C)	0.10	0.15 Max.
Power Vdc	+12	+12
mA	21.0	25.0 Max.

Maximum Ratings

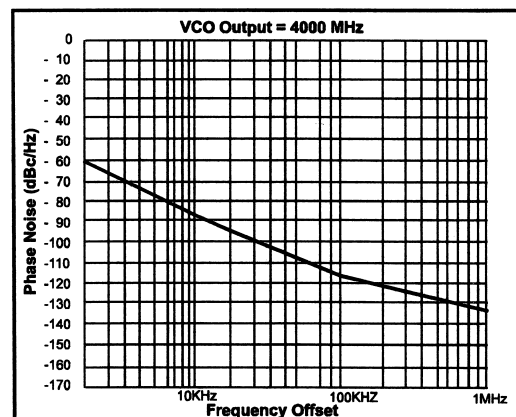
Ambient Operating Temperature -55°C to + 85 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Tuning Voltage (Volts)



Notes:

- 1- Phase Noise is measured using the Aeroflex PN9000.
- 2- Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -95 dBc/Hz

Legend ——— + 25 °C - - - - +50 °C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9340

3200-4000 MHz

Available as:

TOM9340, 4 Pin TO-8 (T4)

TON9340, 4 Pin Surface Mount (SM3)

BXO9340, Connectorized Housing (H1)

Features

- Low Noise Bipolar Transistor
- Broad Tuning Range
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = +25 °C	MIN/MAX Ta = -40°C to +85 °C
Frequency	3200 - 4000 MHz	3200 - 4000 MHz
Output Power (dBm)	+10.0	+ 8.0 Min.
Power Flatness (dBm)	±0.75	±1.5 Max.
Tuning Voltage Range (V)	1.0 to 11.0	0.0 to 12.0
Tuning Voltage Sensitivity (MHz/V)	100.0	80.0 Min.
Harmonics (dBc)	-15.0	-10.0 Max.
Spurious (dBc)	< -80	< -60
3dB Modulation BW, Zg = 50 Ohms	-----	25MHz Max.
Pushing (MHz/V)	3.0	8.0 Max.
Pulling (MHz); 14 dB RL	7.0	12.0 Max.
Frequency Drift (MHz/°C)	0.10	0.15 Max.
Power Vdc	+12	+12
mA	27.0	30.0 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 85 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

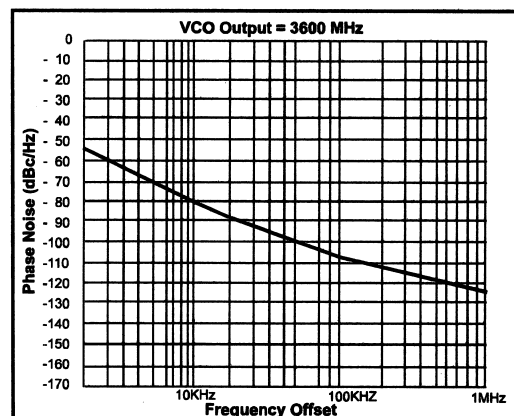
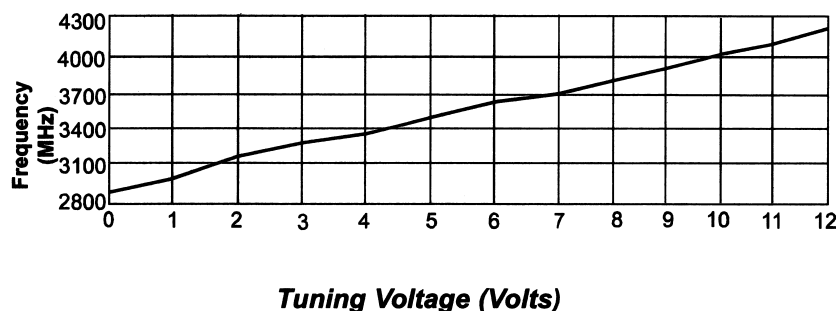
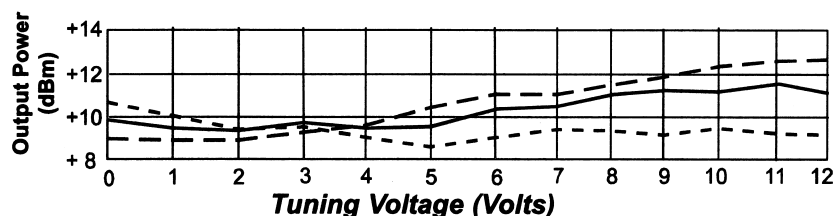
DC Voltage + 20 Volts

Maximum DC Tuning Voltage + 20 Volts

Minimum DC Tuning Voltage 0 Volts

Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data



Notes:

1- Phase Noise is measured using the Aeroflex PN9000.

2- Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -95 dBc/Hz

Legend ——— + 25 °C - - - - +50 °C - - - - - 0 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

03/07/03

VOLTAGE CONTROLLED OSCILLATOR

TOM9341

2200 - 2400 MHz

Available as:

TOM9341, 4 Pin TO-8 (T4)
TON9341-3, 4 Pin Surface Mount (SM3)
TOP9341-4, 4 Pin Flatpack (FP4)
BXO9341, Connectorized Housing (H1)

Features

- n Low Noise Bipolar Transistor
- n Operating Case Temp. -55 °C to + 85 °C
- n Environmental Screening available

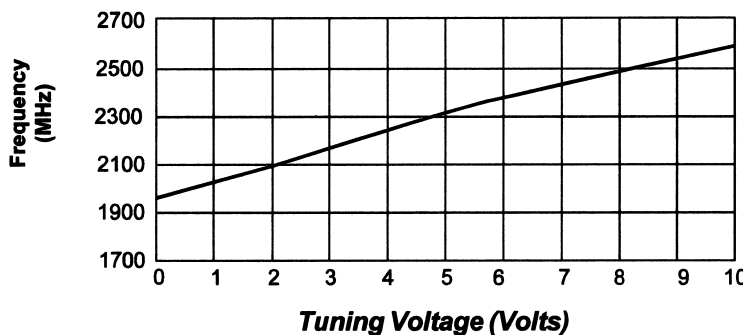
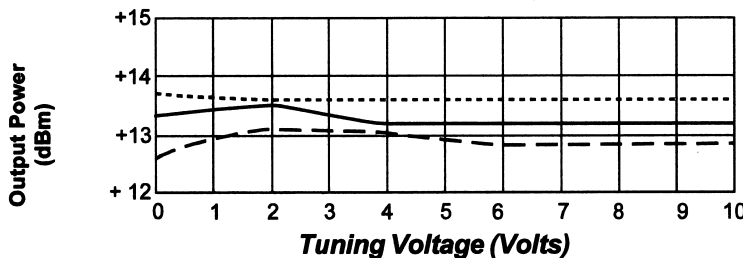
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	2200 - 2400 MHz	2200 - 2400 MHz
Output Power (dBm)	+13	+12 Min.
Power Flatness (dBm)	±0.2	±1.0 Max.
Tuning Voltage Range (v)	3 to 9	3 to 9
Tuning Voltage Sensitivity (MHz/V)	45	30 Min.
Harmonics (dBc)	-30	-20 Max.
Spurious (dBc)	<-80	-60 Max.
Phase Noise @ 100KHz (dBc/Hz)	-105	-100 Max.
Pushing (MHz/V)	4	8 Max.
Pulling (MHz); 20 dB RL	35	43 Max.
Frequency Drift (MHz/°C)	0.07	0.15 Max.
Power Vdc	+15	+15
mA	35	40

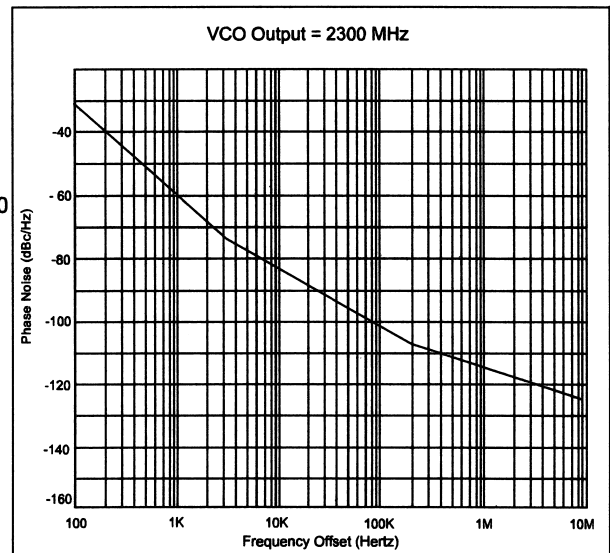
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 20 Volts
Maximum DC Tuning Voltage + 20 Volts
Minimum DC Tuning Voltage 0 Volts

Typical Performance Data



Legend ----- + 25 °C ----- +85 °C - - - - -55 °C



Notes:

1. Phase Noise is measured using the Aeroflex PN9000.
2. Worst case phase noise @ 100KHz offset across frequency range and temperature extremes is -100 dBc/Hz.

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Rev.C04/11/02

Limiting Amps

Amplifonix Limiting Amplifiers range from 7 dB to as high as +55 dB of gain before limiting. These units also duplicate the performance of existing Watkins-Johnson, M/A-Com and Avantek styles as listed in the Cross Reference List.

Model	Frequency Range		Gain		Input Power Limiting Range		Output Level Saturated		Output Power Flatness		Noise Figure Typ. (dB)	VSWR (Max.)	Power	
	(MHz)		(Typ.)	(Min.)	(dBm)		(Typ.)	(Min.)	(Max.)				(DC)	Typ. (mA)
TDL9552	5	500	32	30	-23 to +17		(-2.0)	(-4.0)	±0.5		11.1	2.0:1	±15	±60
ENL9653	5	500	38	30	-30 to +10		(-0.5)	(-2.0)	±1.0		10	2.0:1	15	70
TML9052	5	500	9.5	7.0	- 3 to + 7		(-2.0)	(-4.0)	±0.5		11	2.0:1	±15	±80
TML9053	5	500	9.5	7.0	- 6 to + 7		(-2.0)	(-4.0)	±1.0		10	1.5:1	15	20
TML9002	50	500	12.5	11	0 to +20		(+15)	(+13)	±1.0		9	2.0:1	15	54
TML9004	50	500	10	9.0	0 to +20		(+13.5)	(+12)	±1.0		9	2.0:1	12	50
TML9017	10	1000	11.5	9.5	0 to +20		(+15)	(+13)	±1.0		7.5	2.2:1	15	36
ENL9654	10	1000	55	35	-52 to +10		(0)	(-4.0)	±0.4		9	2.2:1	15	80

Direct Crosses to Other Manufacturer's Parts

W-J, M/A-Com	Amplifonix	Avantek, Avnet	Amplifonix
PPL504	PNL9054	LA-7	TML9002
UDL502	TDL9552	LA-17	TML9017
UTL502	TML9052	LA-88	TML9088
UTL503	TML9053	LG-1	TML9003
		LG-30	TML9009
		AL-7	TL9012

Limiters

Limiting amplifiers operate from 5 MHz to 1 GHz and are useful in protecting circuitry from overdrive damage and for removing amplification modulation from FM signals. Available in 4 Pin TO-8, Surface Mount Packages and Connectorized Housings.

Model	Frequency Range (MHz)		Output Power Level at Limiting Threshold @ 1 dB Compression (dBm)		Maximum Output Limiting Level @ +20dBm Input (dBm)		Insertion Loss @ 15 V (dB)		VSWR In/Out	Power	
	Low	High	(Typ.)	(Max.)	(Typ.)	(Max.)	(Typ.)	(Max.)	(Max.)	DC	mA
TL9010	50	1000	-2.0	+1.0	-1.0	+3.0	2	3.0	2.0:1/2.0:1	+15	7
TL9011	5	500	-2.0	+1.0	-1.0	+3.0	2	3.0	2.0:1/2.0:1	+15	7

Direct Crosses to Other Manufacturer's Parts

Watkins - Johnson, M/A-Com	Amplifonix
L-1	TL9010
L-2	TL9011

RF LIMITING AMPLIFIER

MODEL *TML9002*

Package Style: 4 Pin TO-8

Also Available in: Surface Mount Package and Connectorized Housings

Features

- Frequency: 50 to 500 MHz
- Low Phase Shift per dB of Compression
- Operating Temp. -55°C to +85°C
- Environmental Screening Available

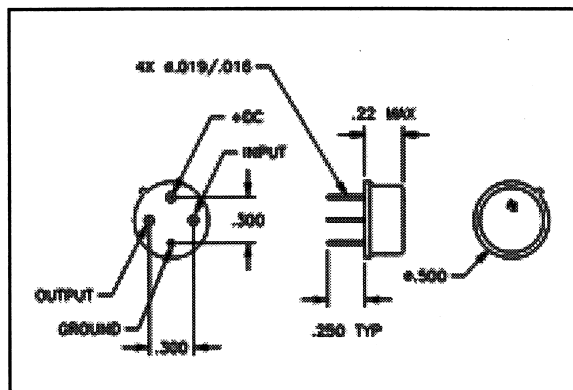
Maximum Ratings

Ambient Operating Temperature ... -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 17 Volts
 Continuous RF Input Power + 15 dBm

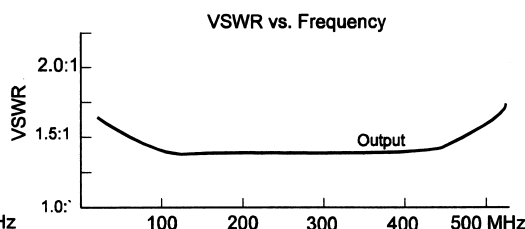
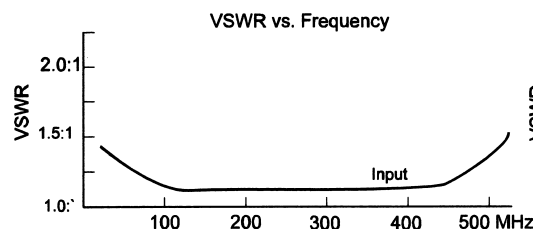
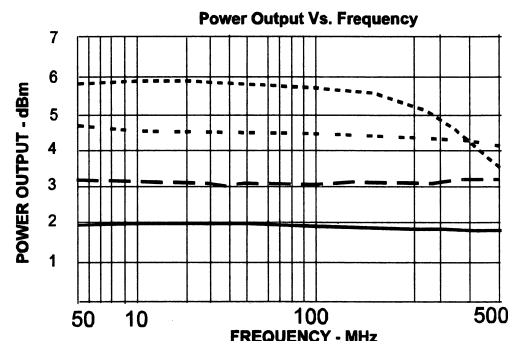
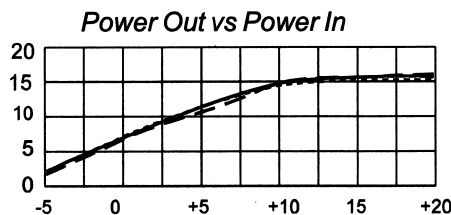
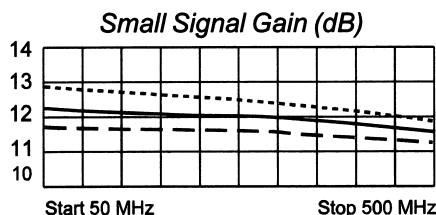
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	50 - 500 MHz	50 - 500 MHz
Small Signal Gain (dB)	12.6	11 Min.
Saturated Output Power (dBm) 50-300	12	8 Min.
300-500	11.5	+7
Saturated Flatness	± 0.2	± 0.7
VSWR Input/Output	1.2:1/1.4:1	2.0:1 Max.
Noise figure (dB)	7.0	9 Max.
Power +Vdc mA	+15 54	+15 58 Max.

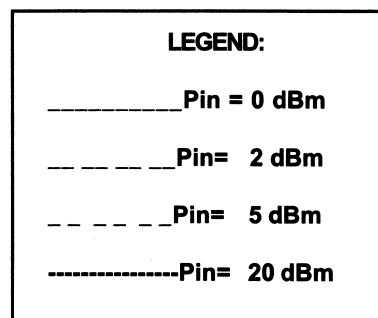
Note: Care should always be taken to effectively ground the case of each unit.



Typical Performance Data



Legend ——— + 25 °C - - - +85 °C -55 °C



Amplifonix

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RF LIMITING AMPLIFIER

MODEL *TML9004*

Package Style: 4 Pin TO-8

Also Available in: Surface Mount Package
and Connectorized Housings

Features

- Frequency: 50 to 500 MHz
- Power Output (1 dB comp.) +11 dBm
- Operating Temp. -55°C to +85°C
- Environmental Screening Available

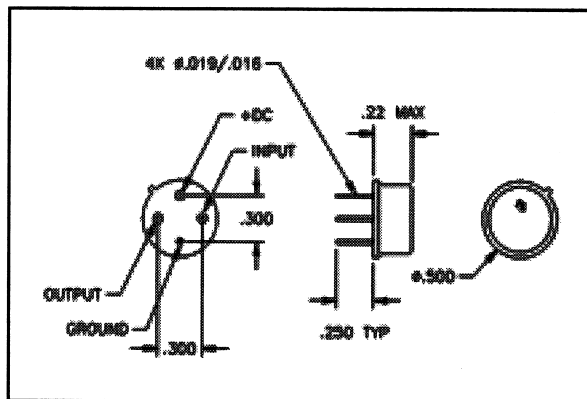
Specifications

CHARACTERISTIC	TYPICAL $T_a = 25^\circ\text{C}$	MIN/MAX $T_a = -55^\circ\text{C to } +85^\circ\text{C}$
Frequency	50 - 500 MHz	50 - 500 MHz
Small Signal Gain (dB)	10	9 Min.
Saturated Output Power (dBm)	11	+8 Min.
Saturated Flatness(dB)	± 0.8	± 1.0
VSWR Input/Output	1.2:1/1.4:1	2.0:1 Max.
Noise figure (dB)	7.0	9 Max.
Power +Vdc mA	+12 50	+12 50 Max.

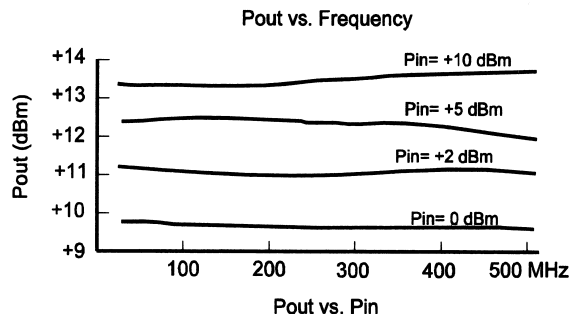
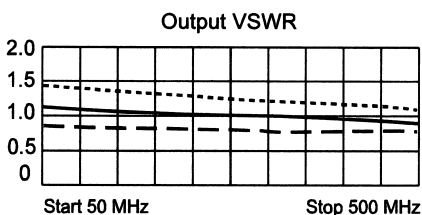
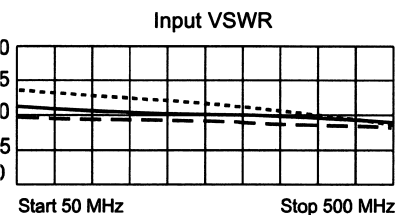
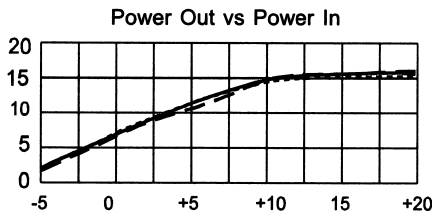
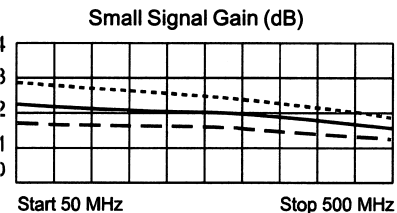
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature ... -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage +17 Volts
Continuous RF Input Power + 15 dBm



Typical Performance Data



Legend ——— + 25 °C - - - +85 °C - - - - -55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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RF LIMITER

MODEL *TL9010*

Available as: TNL9010, 4 Pin Surface Mount (SM3)
FPL9010, 4 Pin Flatpack (FP4)
BXL9010, Connectorized Housing (H1)

Features

- Voltage Variable Limiting Level
- Good Even Order Harmonic Suppression
- Low Insertion Loss
- Low VSWR
- 4 Pin TO-8 Metal Hermetic Package
- Operating Temp. -55 °C to + 100 °C

Specifications

CHARACTERISTIC	TYPICAL	MIN/MAX
Frequency (MHz)	5-1000	50-1000
Insertion loss (dB) @15V	2.0	3.0
Power @ 1 dB comp. (dBm) V= +15V	-2	+1.0
Max output level (dBm) @ +20 dBm input	-1	+3.0
VSWR In	1.7:1	2.0:1
Out	1.7:1	2.0:1
Max Input Level (dBm)	---	+26
Bias Power Vdc	15	20
mA	7	10

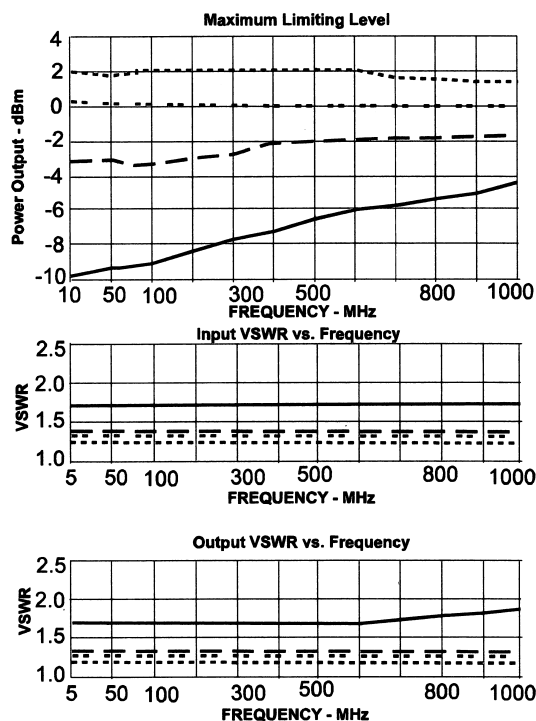
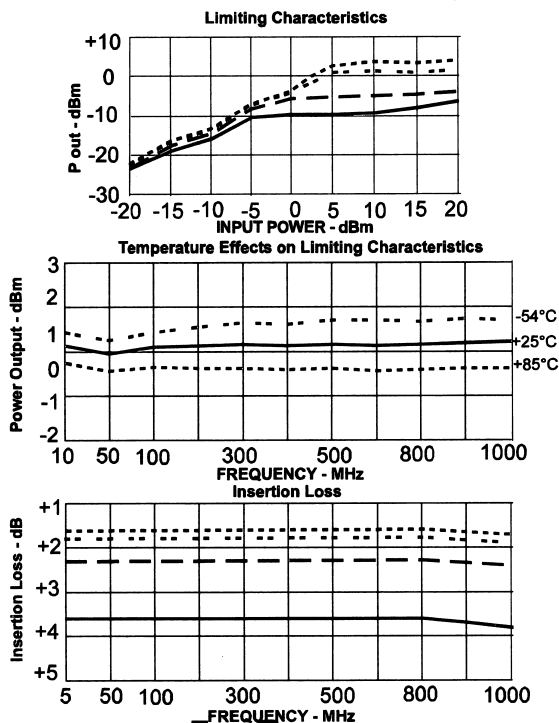
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 13dBm
Short Term RF Input Power 50 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 0.2 Watt
..... (3 µsec Max.)

Legend: ____ +5Vdc ____ +10Vdc ____ +15Vdc -----+20Vdc

Typical Performance Data



Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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RF LIMITER

MODEL

TL9011

Available as: TNL9011, 4 Pin Surface Mount (SM3)

FPL9011, 4 Pin Flatpack (FP4)

BXL9011, Connectorized Housing (H1)

Features

- Voltage Variable Limiting Level
- Good Even Order Harmonic Suppression
- Low Insertion Loss
- Low VSWR
- 4 Pin TO-8 Metal Hermetic Package
- Operating Temp. -55 °C to + 85 °C

Specifications

Note: Care should always be taken to effectively ground the case of each unit.

CHARACTERISTIC	TYPICAL	MIN/MAX
Frequency (MHz)	5 - 500	5 - 500
Insertion Loss Power Input = -20 dBm V=+15	2.0	3.0
Output Level at Limiting Threshold (1 dB comp.)		
V= +20	-5	1.0
V= +15	-1.5	0.0
V= +10	-4.0	-2.5
V= +5	-11.0	-9.0
Max. Output Limiting Level @ +20 dBm (100 MHz)		
V= +20	+2.0	+3.0
V= +15	+1.0	+2.0
V= +10	-2.0	0.0
V= +5	-7.0	---
VSWR In	1.7:1	2.0:1
Out	1.7:1	2.0:1
Max Input Level (dBm)		+26
Bias Power Vdc	+15	+20
mA	7	10

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C

Storage Temperature -62°C to + 125 °C

Case Temperature + 125 °C

DC Voltage + 25 Volts

Continuous RF Input Power + 13dBm

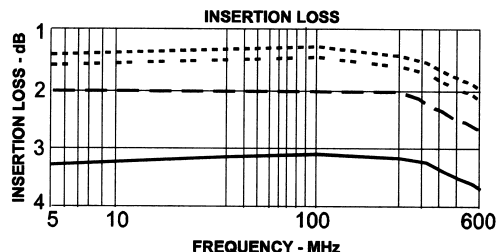
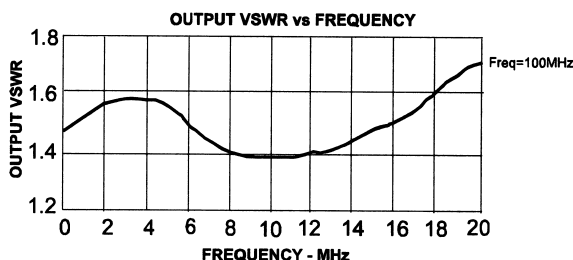
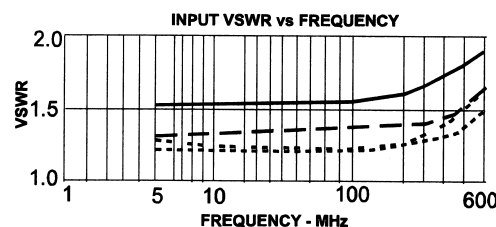
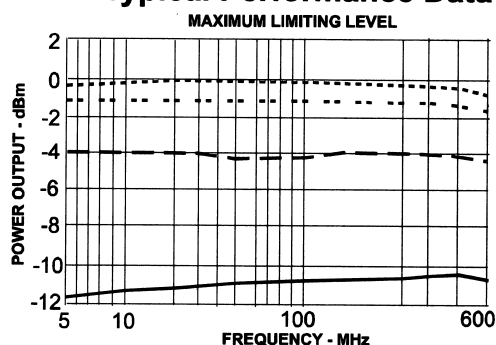
Short Term RF Input Power 400 Milliwatts

..... (1 Minute Max.)

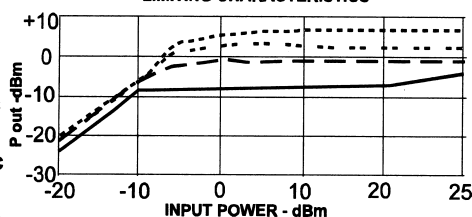
Maximum Peak Power 1.0 Watt

(3 msec Max.)

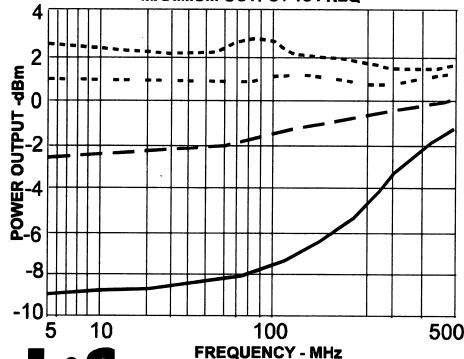
Typical Performance Data



LIMITING CHARACTERISTICS



MAXIMUM OUTPUT vs FREQ



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03/24/2003

RF LIMITING AMPLIFIER

MODEL TML9017

Available as: TNL9017, 4 Pin Surface Mount (SM3)
BXL9017, Connectorized Housing (H1)
TML9017, 4 Pin TO-8 (T4)

Features

- High Output Level: +10 dBm Typical
- Good Even Order Suppression
- Operating Temp. -55°C to +85°C
- Environmental Screening Available

Typical Intermodulation Performance at 25°C

Second Order Harmonic Intercept Point.....+43 (Typ.)
Second Order Two Tone Intercept Point.....+37 (Typ.)
Third Order Two Tone Intercept Point.....+24 (Typ.)

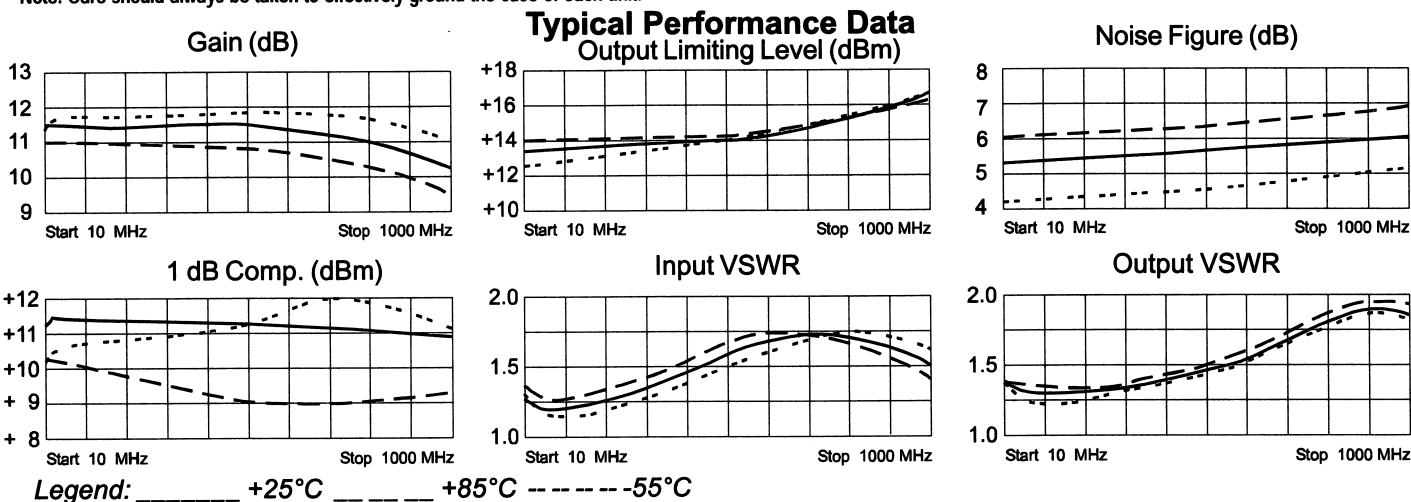
Specifications

CHARACTERISTIC	TYPICAL	MIN/MAX
Frequency (MHz)	10 - 1000 MHz	10 - 1000 MHz
Small Signal Gain (dB)	11.5	9.5 Min.
Power @ 1 dB comp. (dBm)	+11	+7.0 Min.
Output Limiting Level (dBm) PIN=+20 dBm	+15	+17 Max.
VSWR In	<1.75:1	2.0:1 Max.
Out	<1.85:1	2.2:1 Max.
Noise Figure (dB)	5.8	7.5 Max.
Power Vdc	+15	+15
mA	36	42 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 23 dBm
Short Term RF Input Power 400 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power 1.0 Watt
..... (3 µsec Max.)



Linear S-Parameters

Freq	---S11---		---S21---		---S12---		---S22---	
MHz	Mag	Deg	Mag	Deg	Mag	Deg	Mag	Deg
10	.12	-31	3.61	-176	.09	7	.16	166
50	.09	-12	3.67	171	.10	-2	.14	154
100	.09	-6	3.64	160	.10	-4	.15	136
200	.12	-7	3.63	139	.10	-11	.15	101
400	.19	-35	3.65	97	.10	-26	.21	35
600	.25	-73	3.63	54	.11	-44	.28	-22
800	.26	-113	3.50	8	.10	-77	.33	-77
1000	.19	-153	3.26	-39	.11	-72	.32	-137

Amplifonix

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RF LIMITING AMPLIFIER

MODEL *TML9052*

Package Style: 4 Pin TO-8

Also Available in: Surface Mount Package
and Connectorized Housings

Features

- Frequency: 5 to 500 MHz
- Low Phase Shift per dB of Compression
- Operating Case Temp. -55 C to +85 C
- Environmental Screening available

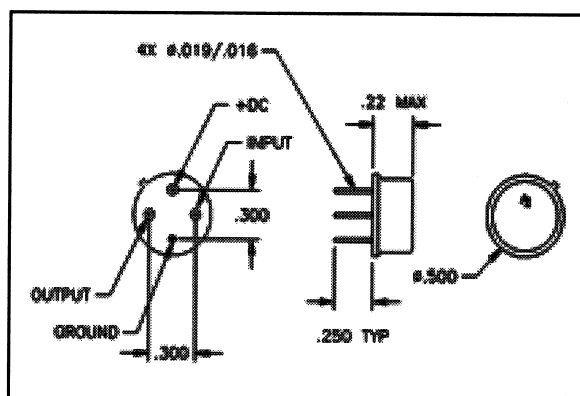
Specifications

CHARACTERISTIC	TYPICAL $T_a = 25^\circ\text{C}$	MIN/MAX $T_a = -55^\circ\text{C to } +85^\circ\text{C}$
Frequency	5 - 500 MHz	5 - 500 MHz
Small Signal Gain (dB)	9	7.0 Min.
Saturated Output Power (dBm)	-2	-4 Min.
Saturated Flatness(dB)	± 0.4	± 0.5
VSWR Input/Output	1.5:1/1.9:1	2.0:1 Max.
Even Harmonic Suppression @ $P_{IN} = -50$ to $+7$ dBm	11	9
Noise figure (dB)	5.5	11 Max.
Power +Vdc -Vdc mA mA	+15 -15 20 20	+15 -15 20 20 Max.

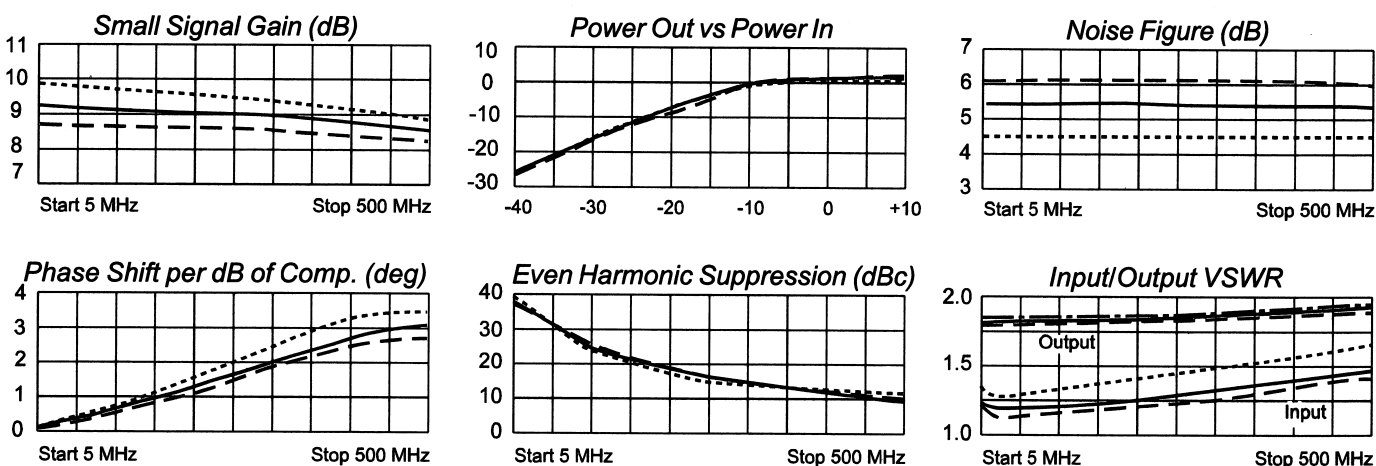
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature ... $-55^\circ\text{C to } +100^\circ\text{C}$
 Storage Temperature $-62^\circ\text{C to } +125^\circ\text{C}$
 Case Temperature $+125^\circ\text{C}$
 DC Voltage $+17$ Volts
 Continuous RF Input Power $+15$ dBm



Typical Performance Data



Legend ——— + 25 °C — — — +85 °C - - - - -55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 •••• FAX 215-464-4001 04/15/03

RF LIMITING AMPLIFIER

MODEL TML9053

Package Style: 4 Pin TO-8

Also Available in: Surface Mount Package and Connectorized Housings

Features

- Frequency: 5 to 500 MHz; Input Power Range: 13 dB
- Low Phase Shift per dB of Compression
- Operating Case Temp. -55 °C to + 85 °C
- Environmental Screening available

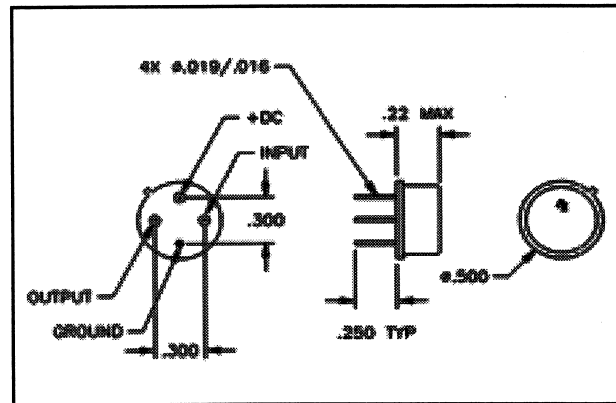
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Small Signal Gain (dB)	9.5	7.0 Min.
Saturated Output Power (dBm)	- 2	- 4 Min.
Saturated Flatness(dB)	±0.3	±1.0 Max.
VSWR Input/Output	1.6/1.7	2.0:1 Max.
Even Harmonic Suppression @ P _{IN} = +7 dBm	12	10 Min.
Noise figure (dB)	<8.0	10.5 Max.
Power +Vdc mA	+15 20	+15 21 Max.

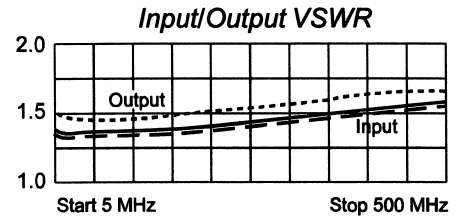
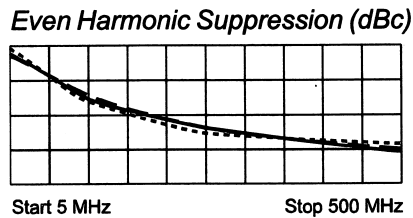
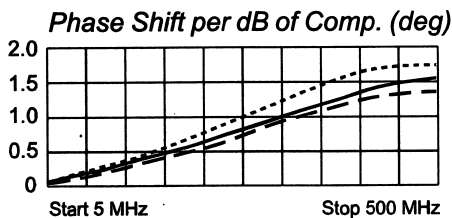
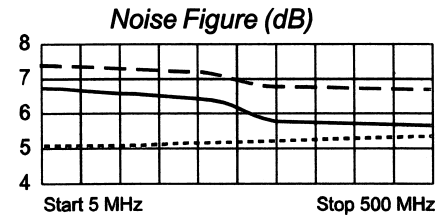
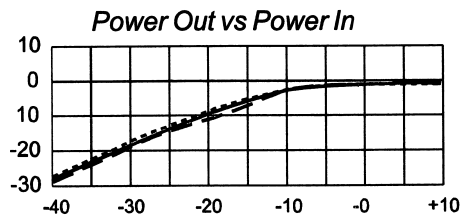
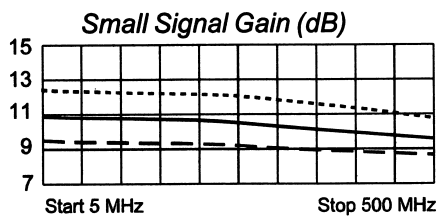
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature ... -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +17 Volts
 Continuous RF Input Power + 15 dBm



Typical Performance Data



Legend ——— + 25 °C — — — +85 °C - - - - -55 °C

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RF LIMITING AMPLIFIER Package Style: 10 Pin 0.800" x 0.400"

MODEL Surface Mount Package

ENL9653

Features

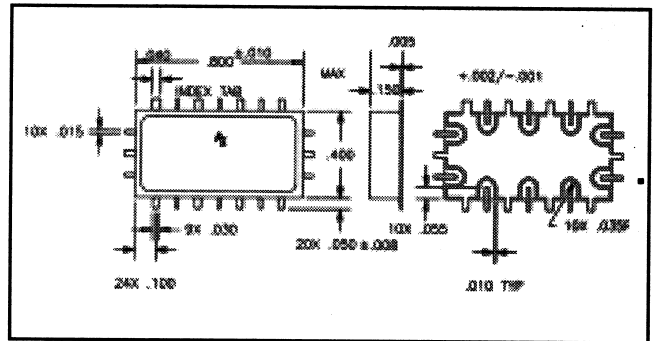
- Compression Range: 40 dB Typical
- Low Phase Shift Variation
- Operating Temperature: -55 °C to +85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	5 - 500 MHz	5 - 500 MHz
Small Signal Gain (dB)	>38	30 Min.
Saturated Power @ P _{IN} = 0 dBm (dBm)	- 0.5	- 4.0 Min.
Saturated Flatness @ P _{IN} = 0 dB	±0.8	±1.5 Max.
VSWR In Out	< 1.25:1 < 1.25:1	2.0:1 Max. 2.0:1 Max.
Phase Shift per dB of Comp. per MHz, (deg.)	0.0035	— Min.
Even Harmonic Suppression @ P _{IN} = -33 to +10 dBm (dBc)	20	15 Max.
Noise figure (dB)	< 8	11 Max.
Power Vdc mA	+15 60	+15 Max. 70 Max.

Maximum Ratings

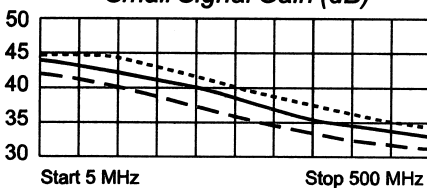
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage.....+17 Volts
 Continuous RF Input Power..... +15 dBm



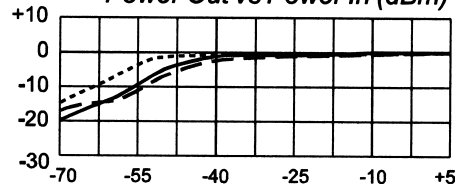
Note: Care should always be taken to effectively ground the case of each unit.

Typical Performance Data

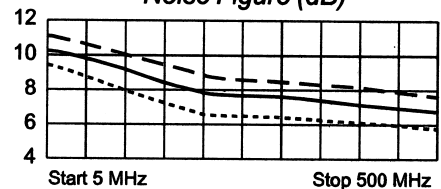
Small Signal Gain (dB)



Power Out vs Power In (dBm)



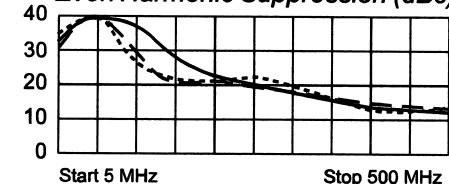
Noise Figure (dB)



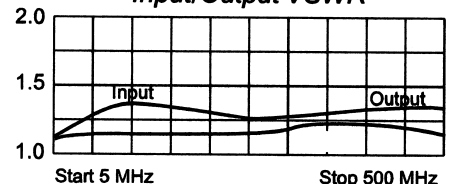
Phase Shift per dB of Comp. (deg)



Even Harmonic Suppression (dBc)



Input/Output VSWR



Legend ——— + 25 °C - - - +85 °C - - - - -55 °C

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RF LIMITING AMPLIFIER Package Style: 10 Pin 0.800" x 0.400"

MODEL Surface Mount Package

(See Outline Dwg.)

ENL9654

Features

- Compression Range: 55 dB Typical
- Low Phase Shift Variation
- Operating Temperature: -55 °C to +85 °C
- Environmental Screening Available

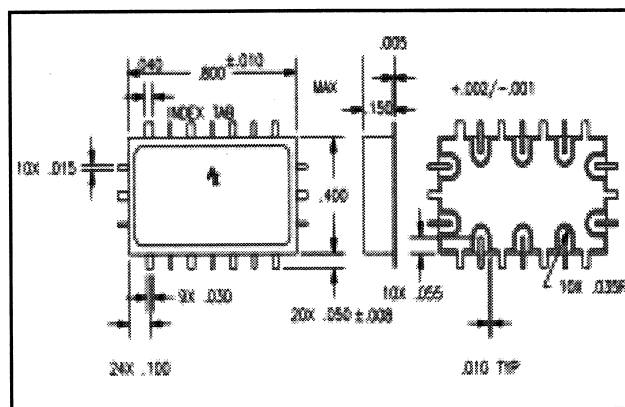
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Small Signal Gain (dB)	>55	30 Min.
Saturated Power @ P _{IN} = 0 dBm (dBm)	- 0.5	- 4.0 Min.
Saturated Flatness @ P _{IN} = 0 dBm	±0.9	±1.5 Max.
VSWR In Out	< 1.25:1 < 1.50:1	2.0:1 Max. 2.0:1 Max.
Phase Shift per dB of Comp. per MHz, (deg.)	0.004	— Min.
Even Harmonic Suppression @ P _{IN} = -55 to +10 dBm (dBc)	> 14	12 Max.
Noise figure (dB)	< 10	12 Max.
Power Vdc mA	+15 75	+15 Max. 80 Max.

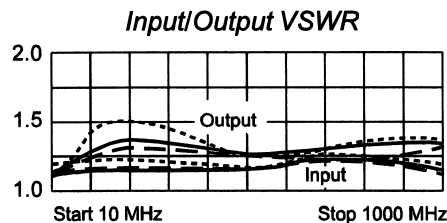
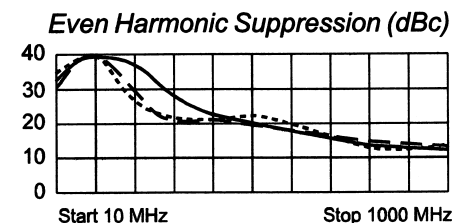
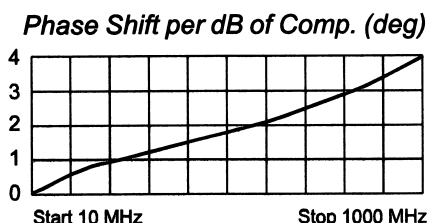
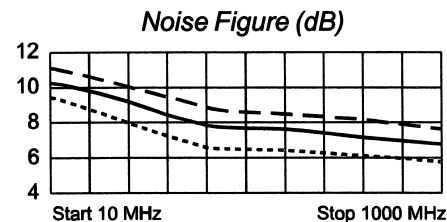
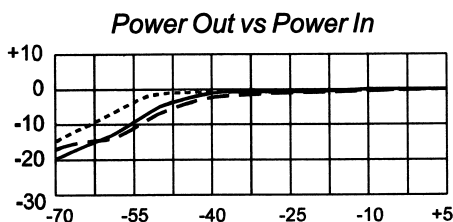
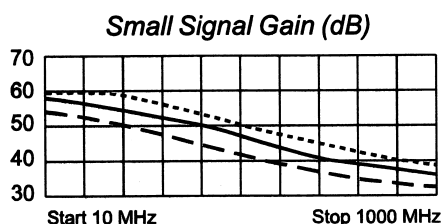
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage.....+17 Volts
 Continuouse RF Input Power..... +13 dBm



Typical Performance Data



Legend ——— + 25 °C - - - - +85 °C -55 °C

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Threshold Detectors

A Threshold Detector provides thermally compensated accurate RF level measurement at critical points in the system. The threshold level can be controlled with an external resistor or an external voltage. Included on this page is a list of Drop-in Replacements to other manufacturer's parts.

Model	Frequency Range (MHz)	Input Flatness (dBm) Typ.	Input Operation (dB) Typ. Max.	VSWR In/Out Max.	Power Typ. (DC) (mA)
TMJ9904	10 2000	±1.0	-20 to +10	2.2:1	+15 5
TMJ9902	10 2000	±0.7	-10 to +10	2.0:1	+15 12
PLJ9962	100 2000	±1.0	-10 to +10	2.0:1	+15 12

Direct Crosses to Other Manufacturers' Threshold Detectors

Avantek, Avnet	Amplifonix
UTD2002	TMJ9902
UTD2004	TMJ9904
PPD6002	PLJ9962

Level Detectors

A Level Detector provides a video output proportional to the input power. Applications may include amplitude detection, automatic level control and signal monitoring. Included on this page is a list of Drop-in Replacements to other manufacturer's parts.

Model	Frequency Range (MHz)	Detected Voltage (mV) Typ.	Input Flatness (dBm)	Tangential Sensitivity Typ. Max.	VSWR In/Out Max.	Power Typ. (DC) (mA)
TMJ9910	10 2000	120	±1.0	-45 40	1.7:1	+15 5
TMJ9911	10 2000	120	±1.0	-45 40	1.7:1	+15 12
LNJ9901	20 2000	120	±0.3	-38 -	2.2:1	+15 12

Direct Crosses to Other Manufacturers' Level Detectors

W-J, M/A-Com	Amplifonix	Avantek, Avnet	Amplifonix
L-1	TL9010	UTD2001	TMJ9901
L-2	TL9011	PPD2001	LNJ9901
		UTD1000	TMJ9910

THRESHOLD DETECTOR *TMJ9902*

PACKAGE: 5 Pin TO-8

Features

- External Threshold Control - Voltage or Resistance
- -10dBm to +10dBm Input Operating Range
- Operating Temp. -55 °C to +85 °C
- Environmental Screening Available

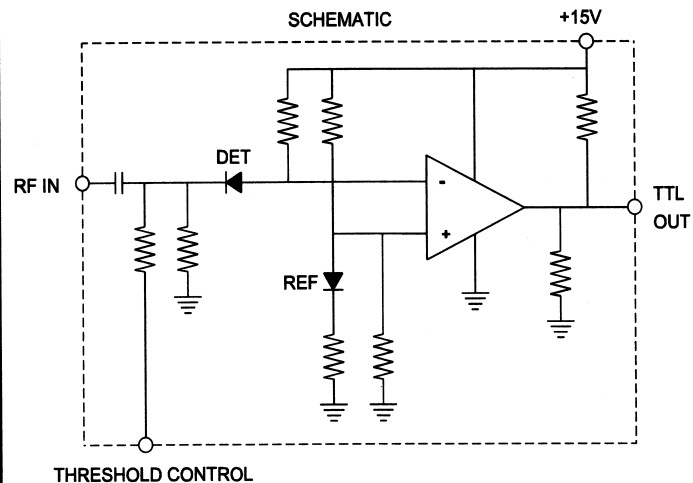
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Input Flatness (dB) P = -20 to +10dBm	±0.4	±1.0 Max.
Input VSWR (Max)	<1.75:1	2.0:1 Max.
Threshold Control Level (V/Ohms) @ P _{IN} = -20 dBm @ P _{IN} = 0 dBm @ P _{IN} = +10 dBm	0.1/325 0.3/950 1.0/3400	
Threshold Temp. Stability (dB) @ P _{IN} = -20 dBm @ P _{IN} = 0 dBm @ P _{IN} = +10 dBm		±1.5 Max. ±1.0 Max. ±0.5 Max.
Threshold Hysteresis Voltage Control (dB) Resistance Control (dB)	<0.1 <1.0	
Output @ P _{IN} = Threshold (V)	3.2	2.7 Min.
Output Short Circuit Current (mA)	8	3.0 Min.
Rise Time/Fall Time (ns)	125	
Power Vdc m A	+15 12	+15 15 Max.

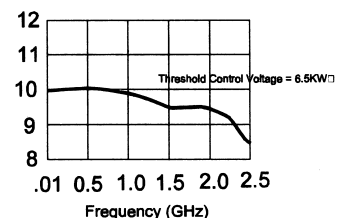
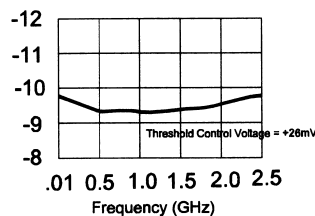
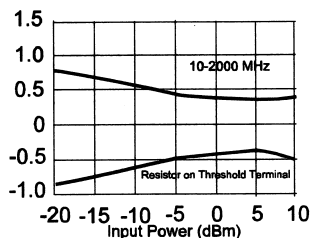
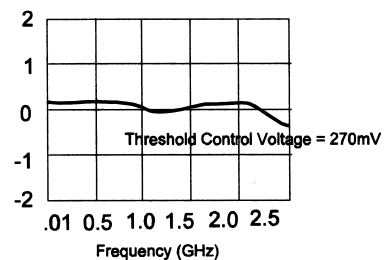
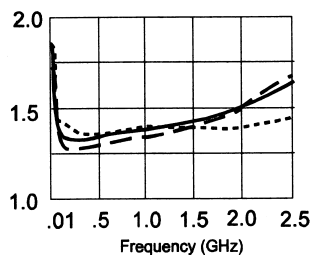
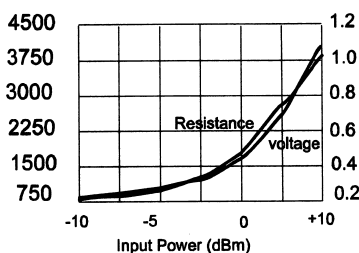
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Operating Case Temperature..... -55 °C to +125 °C
Storage Temperature..... -62 °C to +150 °C
Continuous RF Input Power..... +15 dBm
DC Voltage..... +17 Volts



Typical Performance Data



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9/14/03

THRESHOLD DETECTOR

TMJ9904
10 - 2000 MHz

PACKAGE: 5 Pin TO-8

Features

- External Threshold Control - Voltage or Resistance
- -20dBm to + 10dBm Input Operating Range
- Operating Temp. - 55 °C to +85 °C
- Environmental Screening Available

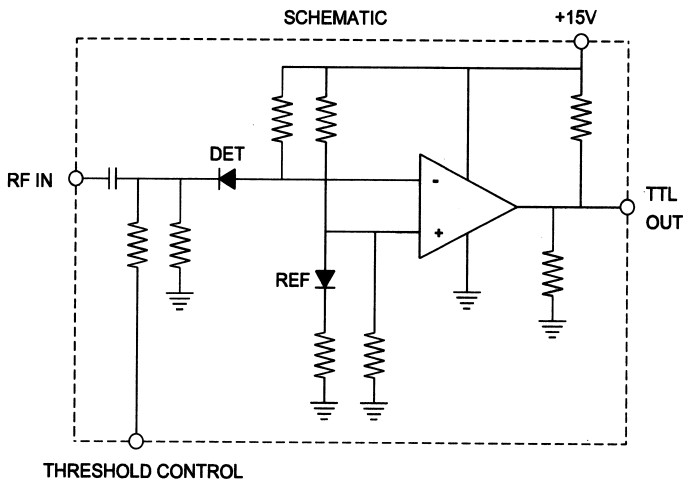
Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Input Flatness (dB) P = -20 to + 10dBm	±1.0	±1.5 Max.
Input VSWR (Max)	<1.75:1	2.0:1 Max.
Threshold Control Level (V/Ohms) @ P _{IN} = -20 dBm @ P _{IN} = 0 dBm @ P _{IN} = +10 dBm	.026/200 .265/2.0K .870/6.5K	
Threshold Temp. Stability (dB) @ P _{IN} = -20 dBm @ P _{IN} = 0 dBm @ P _{IN} = +10 dBm		±1.5 Max. ±1.0 Max. ±0.5 Max.
Threshold Hysteresis Voltage Control (dB) Resistance Control (dB)	<0.1 <1.0	
Output @ P _{IN} = Threshold (V)	3.2	2.7 Min.
Output Short Circuit Current (mA)	8	3.0 Min.
Rise Time/Fall Time (ns)	125	
Power Vdc mA	+15 3	+15 5 Max.

Note: Care should always be taken to effectively ground the case of each unit.

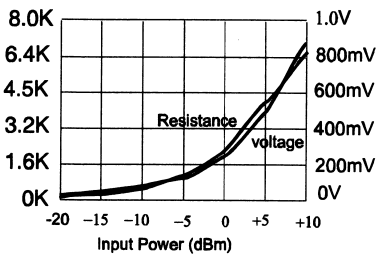
Maximum Ratings

Operating Case Temperature..... - 55 °C to + 125 °C
Storage Temperature..... -62 °C to + 150 °C
Continuous RF Input Power.....+ 15dBm
DC Voltage.....+ 17 Volts

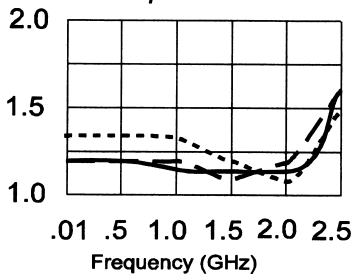


Typical Performance Data

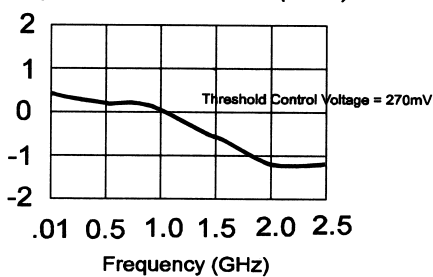
*Control Voltage & Resistance
vs. Input power*



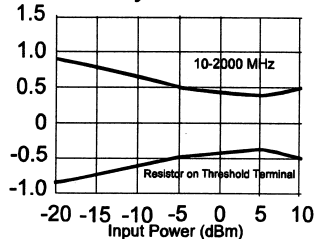
Input VSWR



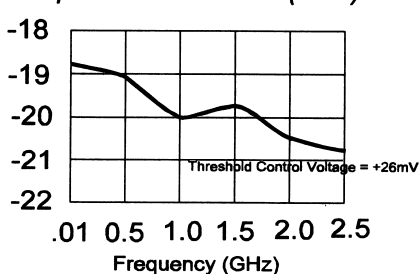
Input Power Flatness (dBm)



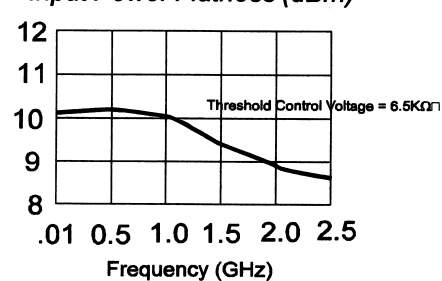
Hysteresis



Input Power Flatness (dBm)



Input Power Flatness (dBm)



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6/20/02

ANALOG LEVEL DETECTOR *TNJ9910*

**PACKAGE: 4 Pin 0.45" Sq. Surface
Mount Package (SM3)**

Features

- -120 mV Output for -10 dBm Input Power
- ± 1.0 dB Flatness
- Operating Temp. -54 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL $T_a = 25\text{ }^\circ\text{C}$	MIN/MAX $T_a = 0\text{ }^\circ\text{C to } +50\text{ }^\circ\text{C}$
Detected Voltage (mV) $f = 500\text{ MHz } \ast\#$	-120	-90 Min.
Flatness (referred to Input) (dB) $f = 10 - 1000\text{ MHz } \ast\#$	± 0.7	± 1.0 Max.
Variation over Temperature (dB) (referred to input), $f = 500\text{ MHz } \ast\#$	± 1	
Tangential Sensitivity (TSS)(dBm) $f = 500\text{ MHz, BW}_{VID} = 1\text{ MHz} \ast$	-45	-40 Max.
Input VSWR, 50 Ω $f = 10 - 500\text{ MHz}$	1.5:1	1.5:1 Max.
Output Offset Voltage (mV) $I_D = I_{REF} = 50\text{ }\mu\text{A, no RF Drive}$	± 10	± 15.0 Max.
Differential Voltage Tracking (mV)	± 5	
Output Capacitance (pf)	1000	1300 Max.
Power Vdc mA	+15 16	+15 20 Max.

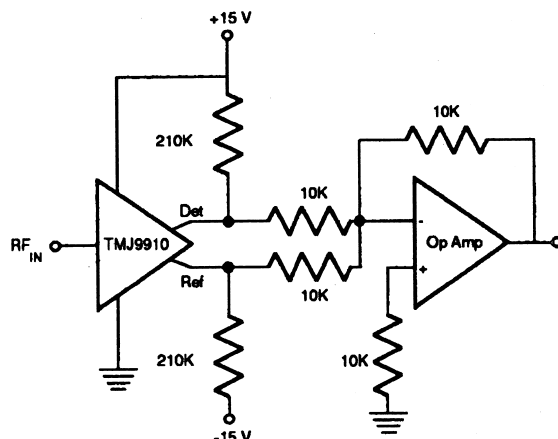
Note: Care should always be taken to effectively ground the case of each unit.

$\ast I_D = 50\text{ }\mu\text{A, } R = 10\text{ K}\Omega$

$\# P_{IN} = -10\text{ dBm (RF Input)}$

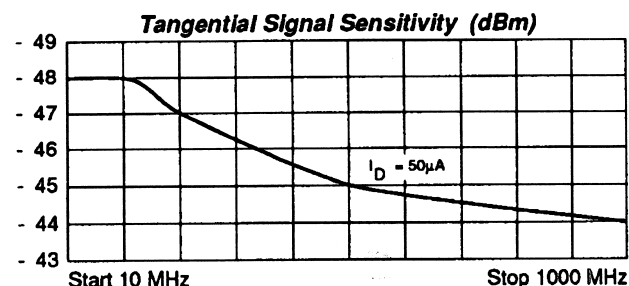
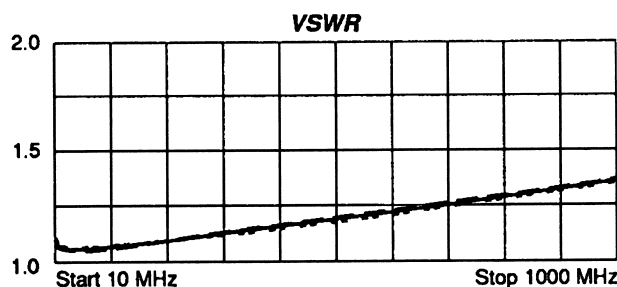
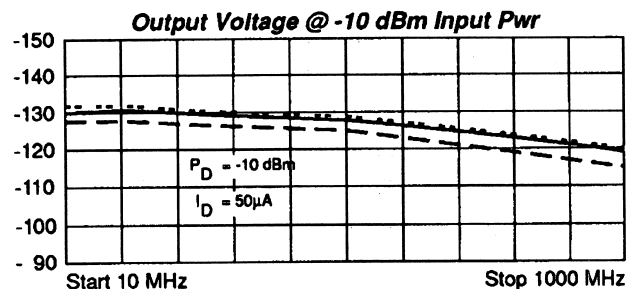
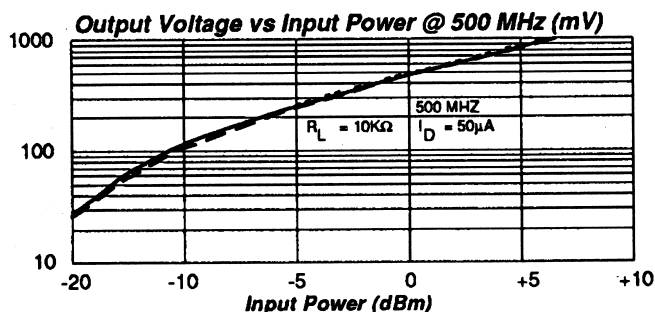
Maximum Ratings

Operating Case Temperature -55 °C to +125 °C
Storage Temperature -62 °C to +150 °C
Bias Current (Diode) 1 mA
Continuous RF Input Power +17 dBm
Short Term RF Input Power 100 mW
(1 Minute Max.)



Bias Circuit

Typical Performance Data



Amplifonix

Legend — +25 °C — — +50 °C 0 °C

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ANALOG LEVEL DETECTOR

TMJ9911

PACKAGE: 5 Pin TO-8

Features

- -120 mV Output for -10 dBm Input Power.
- ± 1.0 dB Flatness
- Operating Temp. -54 °C to +85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = 0 °C to +50 °C
Detected Voltage (mV) f = 500 MHz *#	-120	-90 Min.
Flatness (referred to Input) (dB) f = 10 - 1000 MHz *#	± 0.7	± 1.5 Max.
Variation over Temperature (dB) (referred to Input), f = 500 MHz *#	± 1	
Tangential Sensitivity (TSS)(dBm) f = 500 MHz, BW _{VID} = 1 MHz*	-32	-30 Max.
Input VSWR, 50 Ω f = 10 - 500 MHz	1.5:1	1.5:1 Max.
Output Offset Voltage (mV) I _D = I _{REF} = 50 μ A, no RF Drive	± 10	± 15.0 Max.
Differential Voltage Tracking (mV)	± 5	
Output Capacitance (pf)	1000	1300 Max.
Power Vdc mA	+15 16	+15 20 Max.

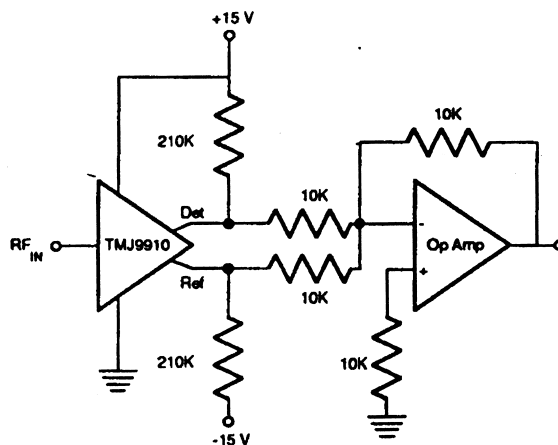
Note: Care should always be taken to effectively ground the case of each unit.

* I_D = 50 μ A, R = 10K Ω

P_{IN} = -10 dBm (RF Input)

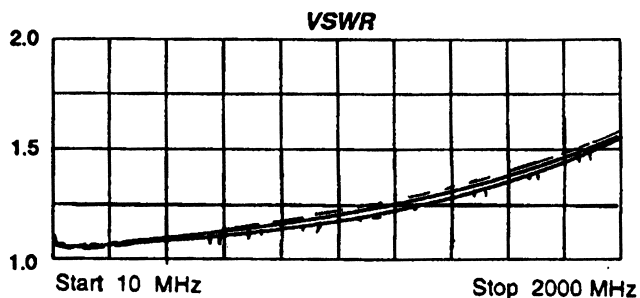
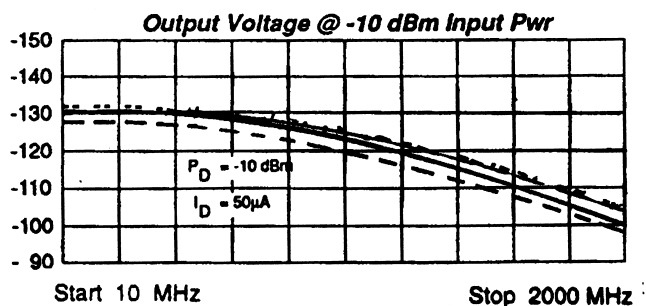
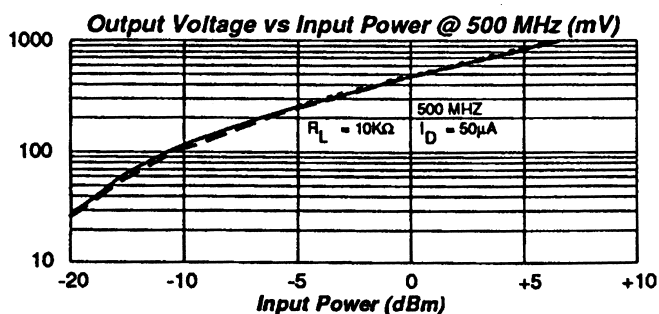
Maximum Ratings

Operating Case Temperature -55 °C to +125 °C
 Storage Temperature -62 °C to +150 °C
 Bias Current (Diode) 1 mA
 Continuous RF Input Power +17 dBm
 Short Term RF Input Power 100 mW
 (1 Minute Max.)



Bias Circuit

Typical Performance Data



Legend — +25 °C - - - +50 °C 0 °C

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06/07/02

Digital Attenuators

Amplifonix Digital Attenuators range from KHz to 2000 MHz.

These designs have sensitivity of as little as 0.1 dB and continue to a full 63.5 dB.

Model	Frequency Range (MHz)	Steps	Attenuation Range (dB)	Insertion Loss (dB) (Typ.) (Max.)	Switching Speed (μ s)	Control	Package Type	Power Typ. (DC) (mA)
TAN6007	KHz 50	4	2.0 to 30	1.5 2.0	0.03	TTL	SG-4	(+5/-5 V) 3/3
TAD5006	10 150	4	2.0 to 30	2.5 3.3	10	TTL	DP-5	(+5 V) 22
TAD5007	10 150	4	3.0 to 45	2.5 3.3	10	TTL	DP-5	(+5 V) 25
TAN6008	50 500	4	2.0 to 30	2.0 3.3	0.03	TTL	SG-4	(+5/-5 V) 3/3
TAD6006	50 500	4	2.0 to 30	2.2 3.0	0.02	TTL	DP-11	(+5/-5 V) 3/3
TAD6005	50 300	5	1.0 to 31	3.0 4.0	0.03	TTL	DP-5	(+5/-12 V) 3/4
TAD2104	20 2000	5	1.0 to 31	6.5 8.5	0.02	TTL	DP-5	(+5/-12 V) 5/8
TAD5008	50 250	5	2.0 to 62	4.2 5.5	2.5	TTL	DP-5	(+5 V) 10
TAD5009	50 250	7	0.1 to 12.7	3.0 4.2	2.5	TTL	DP-8	(+5 V) 10
TAD5010	50 250	7	0.5 to 63.5	6.0 7.5	10	TTL	DP-8	(+5 V) 25

Voltage Variable (Analog) Attenuators

Amplifonix Analog Attenuators range from 100 KHz to 2000 MHz.

Units can be adjusted up to a max attention of 40 dB.

Model	Frequency Range (MHz)	Insertion Loss (Typ.) (Max.)	Attenuation (dB) (Typ.) (Min.)	VSWR	Control Voltage	Control Current	Power Typ. (DC) (mA)
TG9015	5 1000	2.0 2.5	20 15	2.0:1	0 to -10	0 to 7.0	15 7.0
TG9005	0.1 1400	2.0 2.5	26 25	2.0:1	0 to +15	0 to 7.5	15 10
TG9001	5 2000	2.9 2.5	34 18	2.0:1	0 to +15	0 to 6.5	15 10
TG9006	5 1600	2.0 2.5	34 18	2.0:1	0 to +12	0 to 6.5	12 10
TG9025	5 2000	2.0 3.0	33 20	2.0:1	0 to +15	0 to 7.0	15 10
TG9030	100 2000	2.5 3.5	40 25	2.2:1	0 to +15	0 to 10	15 10

Direct Crosses to Other Manufacturer's Parts

W-J, M/A-Com	Amplifonix	Avantek, Avnet	Amplifonix	Cougar	Amplifonix
G-1	TG9001	UTF015	TG9015	GC2001	TG9001
G-2	TG9022	UTF025	TG9001	GC9030	TG9030
G-3	TG9030	UTF015	TG9015		

*** Please visit our website for the most current list of Drop-in Replacement Parts ***

5 BIT DIGITAL ATTENUATOR

TAD2104

Available in:
DP-5, 24 Pin DIP Package
and Connectorized Housings

Features

- 10 - 2000 MHz; 31 dB Attenuation Range
- Fast Switching Speed: 15 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. -55 °C to + 85 °C
- Environmental Screening available

Specifications

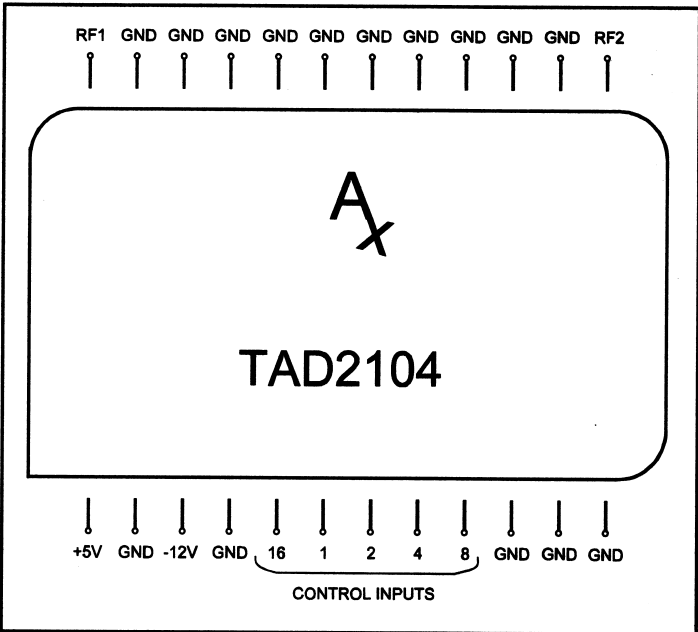
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 2000 MHz	10 - 2000 MHz
Insertion Loss (dB)	<6.5	8.5 Max.
Attenuation Range (dB)	1 - 31	1 - 31 Min.
Steps (dB)	1,2,4,8,16	1,2,4,8,16
Accuracy	±0.5 dB ±2%	±0.5 dB Max. ±4%
VSWR	1.5:1	1.75:1 Max.
Switching Speed (nsec)	<20	30 Max.
Transients (mV)	<25	35 Max.
DC Bias VDC	- 12	- 12
Bias mA	4.5	8.0 Max.
DC Bias VDC	+5	+5
Bias mA	3.0	5.0 Max.

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 6.0, -16 Volts
Continuous RF Input Power +30 dBm

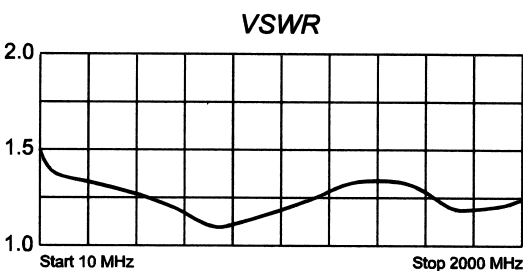
Pin Layout



Truth Table

Control Input 5 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 FAX 215-464-4001 Rev. A 07/18/01

4 BIT DIGITAL ATTENUATOR

TAD5006

Available in:
DP-5, 24 Pin DIP Package
and Connectorized Housings

- 10 - 150 MHz
- 30dB Attenuation Range
- Integral TTL Driver
- Operating Temp. -55°C to + 85°C
- Screening to the tables of MIL-STD-883 available

Specifications

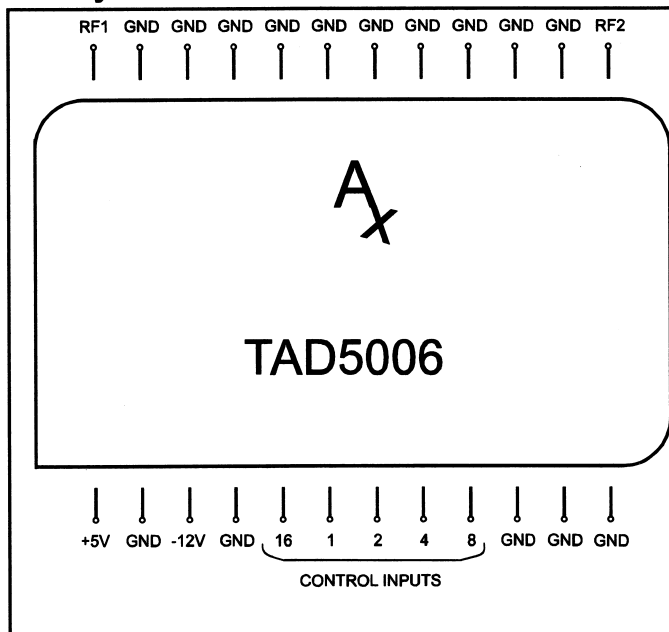
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 150 MHz	10 - 150 MHz
Insertion Loss (dB)	2.5	3.3 Max.
Attenuation Range (dB)	2 - 30	2 - 30
Steps (dB)	2,4,8,16	2,4,8,16
Accuracy	±0.2 dB ±0.5%	±0.3 dB Max. ±1%
VSWR	1.4:1	1.65:1 Max.
Switching Speed (µsec)	3	10 Max.
Switching Transients (V)	0.5	1.0 Max.
DC Bias VDC Bias mA	+5 22	+5 30 Max.

Note: Care should always be taken to effectively ground case of each unit

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage +6 Volts
Continuous RF Input Power +30 dBm

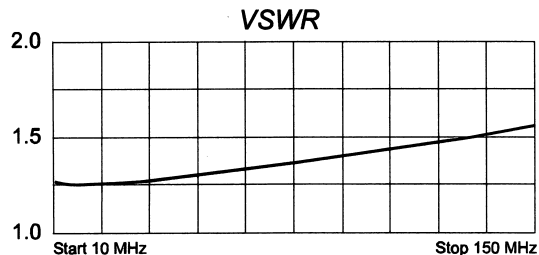
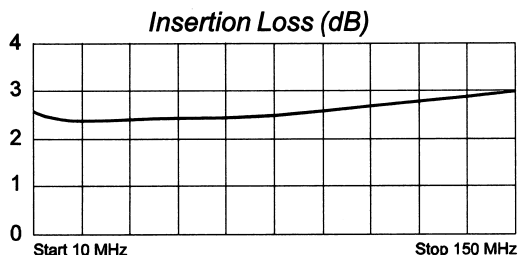
Pin Layout



Truth Table

Control Input 4 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

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4 BIT DIGITAL
ATTENUATOR

TAD5007

Available in:
DP-5, 24 Pin DIP Package
and Connectorized Housings

- 10 - 150 MHz
- 45 dB Attenuation Range
- Integral TTL Driver
- Operating Temp. -55°C to + 85°C
- Screening to the tables of MIL-STD-883 available

Maximum Ratings

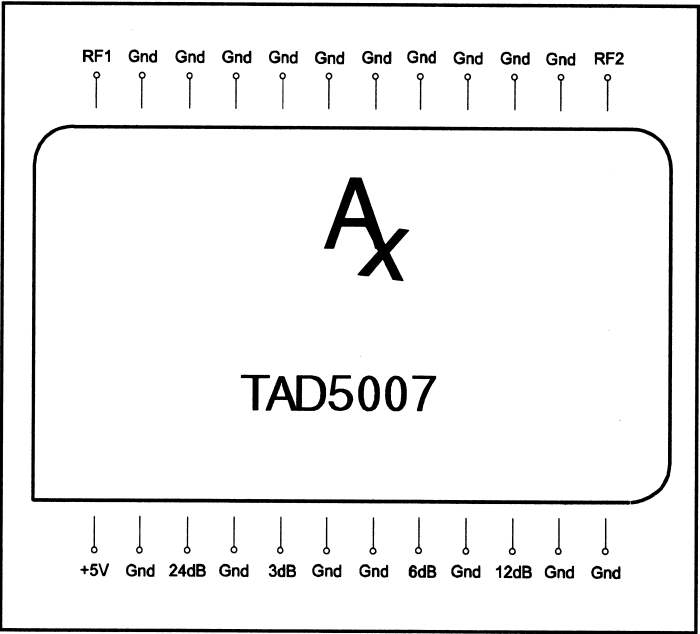
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 6 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	10 - 150 MHz	10 - 150 MHz
Insertion Loss (dB)	2.5	3.3 Max.
Attenuation Range (dB)	3 - 45	3 - 45
Steps (dB)	3,6,12,24	3,6,12,24
Accuracy	±0.2 dB ±0.5%	±0.3 dB Max. ±1%
VSWR	1.4:1	1.65:1 Max.
Switching Speed (µsec)	10	15 Max.
Transients (V)	0.5	1.0 Max.
DC Bias	VDC +5 mA 25	+5 30 Max.

Note: Care should always be taken to effectively groung the case of each unit

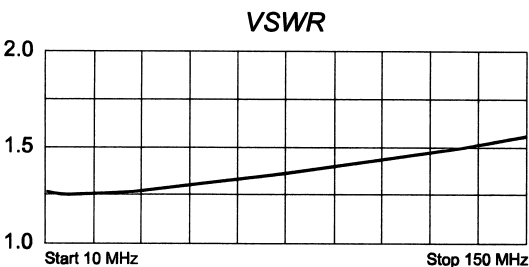
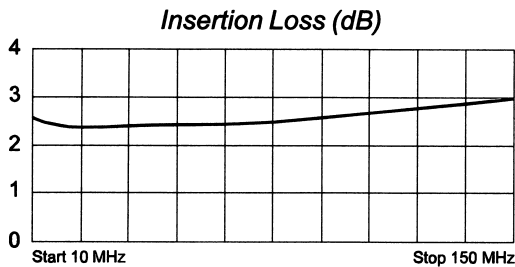
Pin Layout



Truth Table

Control Input 4 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



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5 BIT DIGITAL ATTENUATOR

TAD5008

Available in:
DP-5, 24 Pin DIP Package
and Connectorized Housings

- 50 - 250 MHz
- 62 dB Attenuation Range
- Integral TTL Driver
- Operating Temp. -55°C to +85°C
- Screening to the tables of MIL-STD-883 available

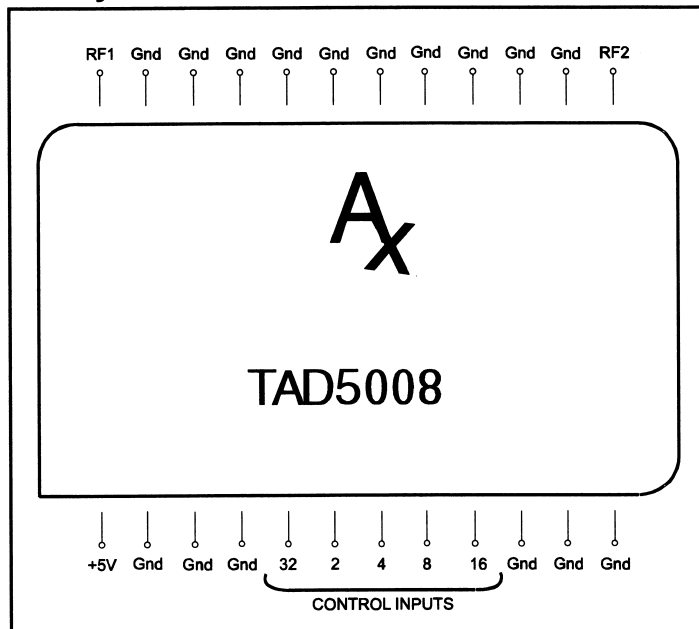
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	50 - 250 MHz	50 - 250 MHz
Insertion Loss (dB)	4.5	5.5 Max.
Attenuation Range (dB)	2 - 62	2 - 62
Steps (dB)	2,4,8,16,32	2,4,8,16,32
Accuracy	±0.2 dB ±1.5%	±0.25 dB Max. ±2.5%
VSWR	1.5:1	1.7:1 Max.
Switching Speed (μsec)	2.5	3 Max.
Switching Transients (V)	0.8	1.0 Max.
DC Bias VDC Bias mA	+5 10	+5 15 Max.

Maximum Ratings

Ambient Operating Temperature	-55°C to + 100 °C
Storage Temperature	-65°C to + 125 °C
Case Temperature	+ 125 °C
DC Voltage	+ 6.0 Volts
Continuous RF Input Power	+30 dBm

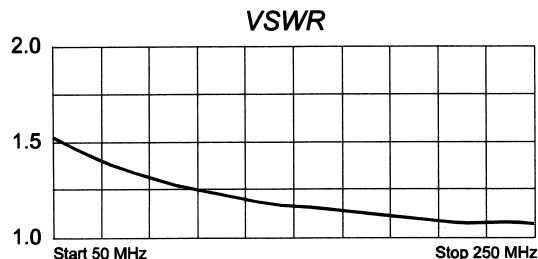
Pin Layout



Truth Table

Control Input 5 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

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7 BIT DIGITAL ATTENUATOR *TAD5009*

Package: 38 Pin DIP (DP-8)

Also Available In: Connectorized Housings

Features

- 50 - 250 MHz
- 12.7 dB Attenuation Range
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

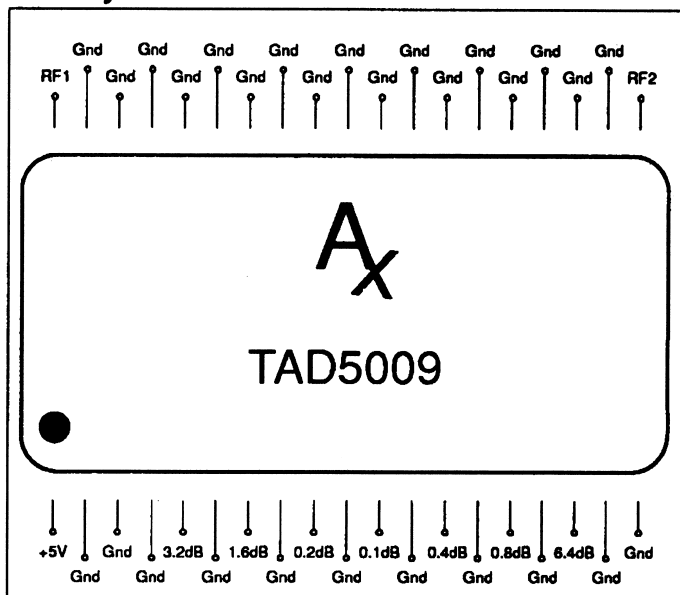
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +6 Volts
 Continuous RF Input Power +20 dBm

Specifications

CHARACTERISTIC	TYPICAL $T_a = 25\text{ }^{\circ}\text{C}$	MIN/MAX $T_a = -55\text{ }^{\circ}\text{C to } +85\text{ }^{\circ}\text{C}$
Frequency	50 - 250 MHz	50 - 250 MHz
Insertion Loss (dB)	3	4.2 Max.
Attenuation Range (dB)	0.1 - 12.7	0.1 - 12.7
Steps (dB)	0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4	0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4
Accuracy	0.1 to 0.8 dB 0.9 to 6.3 dB 6.4 to 12.7 dB	$\pm (0.05\text{ dB} + 2\%)$ Max. $\pm (0.20\text{ dB} + 2\%)$ Max. $\pm (0.30\text{ dB} + 3\%)$ Max.
VSWR	1.25:1	1.5:1 Max.
Switching Speed (μsec)	2.5	5 Max.
Switching Transients (V)	0.8	1.0 Max.
DC Bias	Vdc mA	+5 15 Max.

Note: Care should always be taken to effectively ground the case of each unit

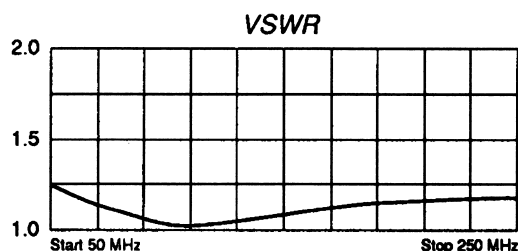
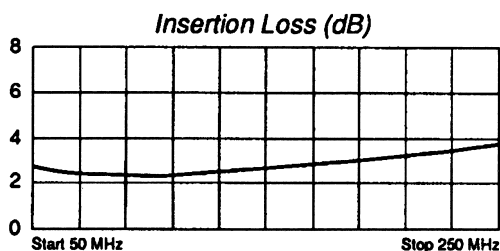
Pin Layout



Truth Table

Control Input 7 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



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7 BIT DIGITAL ATTENUATOR *TAD5010*

Outline Drawings: Pages 14 -19

Available in: DP-8, 38 Pin Dip Package
and Connectorized Housings

Features

- 50 - 250 MHz
- 63.5 dB Attenuation Range
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Maximum Ratings

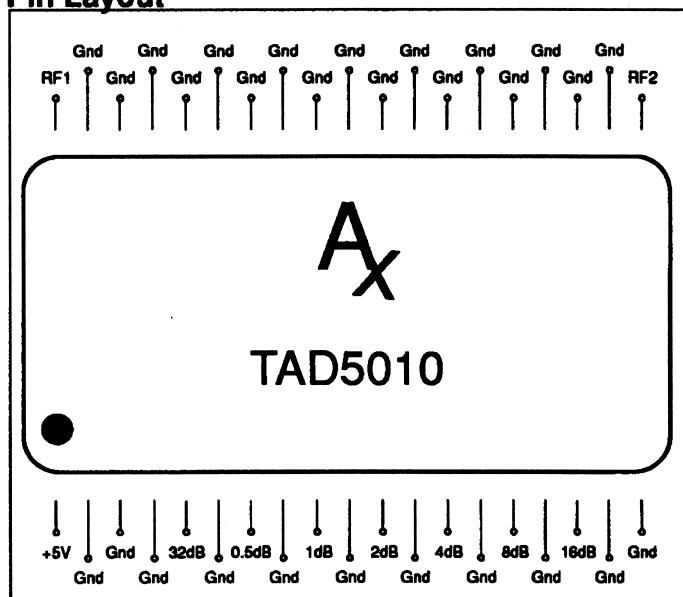
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage +6 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	50 - 250 MHz	50 - 250 MHz
Insertion Loss (dB)	5.0	7.5 Max.
Attenuation Range (dB)	0.5 - 63.5	0.5 - 63.5
Steps (dB)	0.5,1,2,4,8,16,32	0.5,1,2,4,8,16,32
Accuracy	±0.2 dB ±1.5%	±0.25 dB ±2.5% Max.
VSWR	1.25:1	1.5:1 Max.
Switching Speed (µsec)	6	10 Max.
Switching Transients (V)	0.8	1.0 Max.
DC Bias	Vdc mA	
	+5 25	+5 30 Max.

Note: Care should always be taken to effectively ground the case of each unit

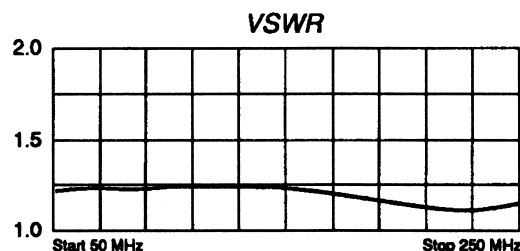
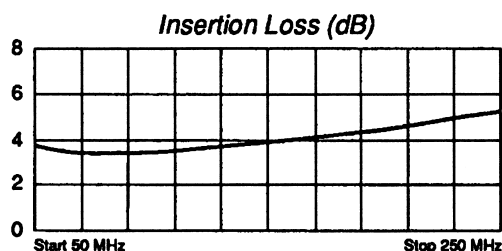
Pin Layout



Truth Table

Control Input 7 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



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Rev. A 09/04/92

5 BIT DIGITAL ATTENUATOR

TAD6005

Available in:
DP-5, 24 Pin DIP Package
and Connectorized Housings

- 50 - 300 MHz
- Fast Switching Speed: 20 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. -55°C to + 85°C
- Screening to the tables of MIL-STD-883 available

Maximum Ratings

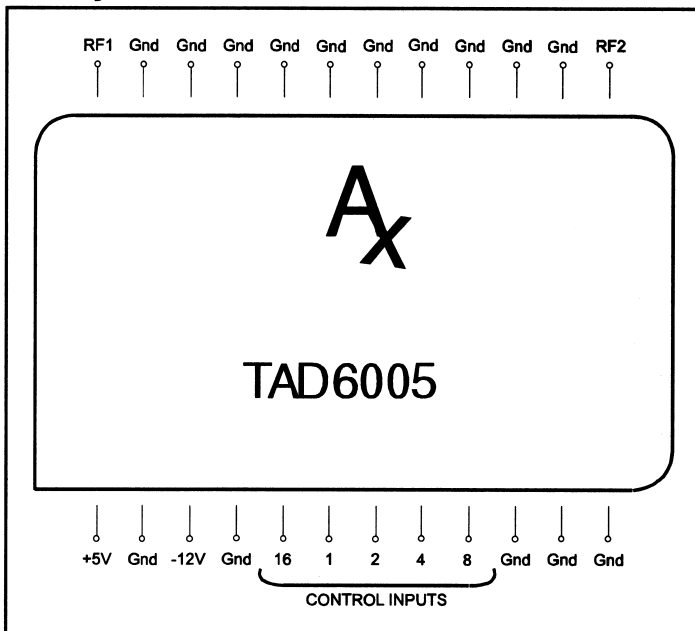
Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 6.0, -13 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	40 - 350 MHz	50 - 300 MHz
Insertion Loss (dB)	3.0	4.0 Max.
Attenuation Range (dB)	1 - 31	1 -31
Steps (dB)	1,2,4,8,16	1,2,4,8,16
Accuracy	±0.15 dB ±1%	±0.25 dB Max. ±2%
VSWR	1.2:1	1.4:1 Max.
Switching Speed (nsec)	20	30 Max.
Transients (mV)	300	350 Max.
DC Bias VDC	+5	+6
Bias mA	3	5 Max.
DC Bias VDC	- 12	- 12
Bias mA	4	8 Max.

Note: Care should always be taken to effectively ground case of each unit

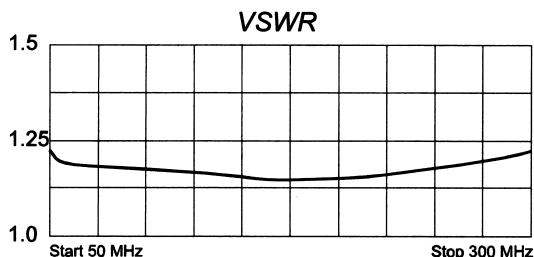
Pin Layout



Truth Table

Control Input 5 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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4 BIT DIGITAL ATTENUATOR

TAD6006

Available in:
DP-11, 14 Pin DIP Package
and Connectorized Housings

- 50 - 500 MHz
- Fast Switching Speed: 20 ns Typical (GaAs)
- Integral TTL Driver
- Operating Tem. -55°C to +85 °C
- Screening to the tables of of MIL-STD-883 available

Specifications

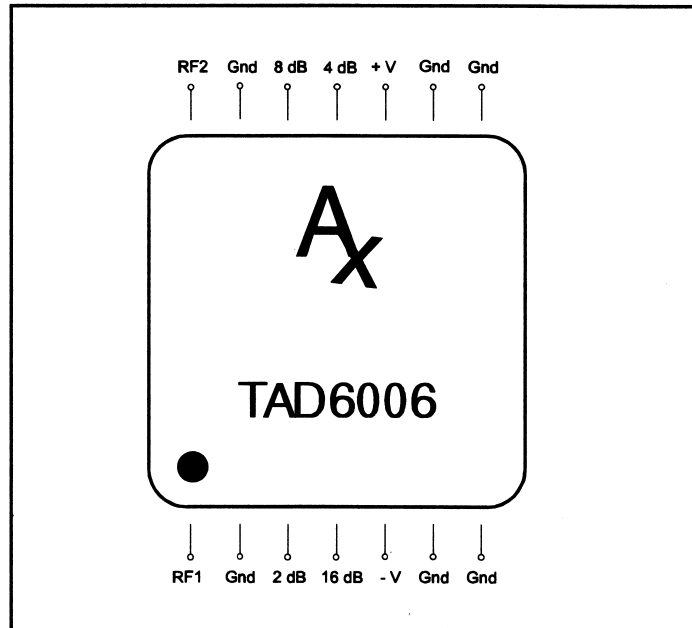
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	50 - 500 MHz	50 - 500 MHz
Insertion Loss (dB)	2.2	3.0 Max.
Attenuation Range (dB)	2 - 30	2 -30
Steps (dB)	2,4,8,16	2,4,8,16
Accuracy	±0.15 dB ±1%	±0.25 dB Max. ±2%
VSWR	1.15:1	1.5:1 Max.
Switching Speed (nsec)	20	30 Max.
Transients (mV)	300	350 Max.
DC Bias VDC mA	+5 3	+5 5 Max.
DC Bias VDC mA	- 5 3	- 5 5 Max.

Note: Care should always be taken to effectively ground the case of each unit

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage ±6 Volts
Continuous RF Input Power +30 dBm

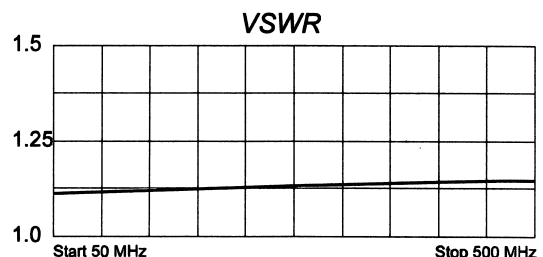
Pin Layout



Truth Table

Control Input 4 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



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4 BIT DIGITAL ATTENUATOR

TAN6007

Available in:

SG4, 10 Lead Gull Wing

Package and Connectorized Housings

Features

- DC - 50 MHz
- Fast Switching Speed: 20 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. -55 °C to +85 °C
- Screening to the tables of MIL-STD-883 available

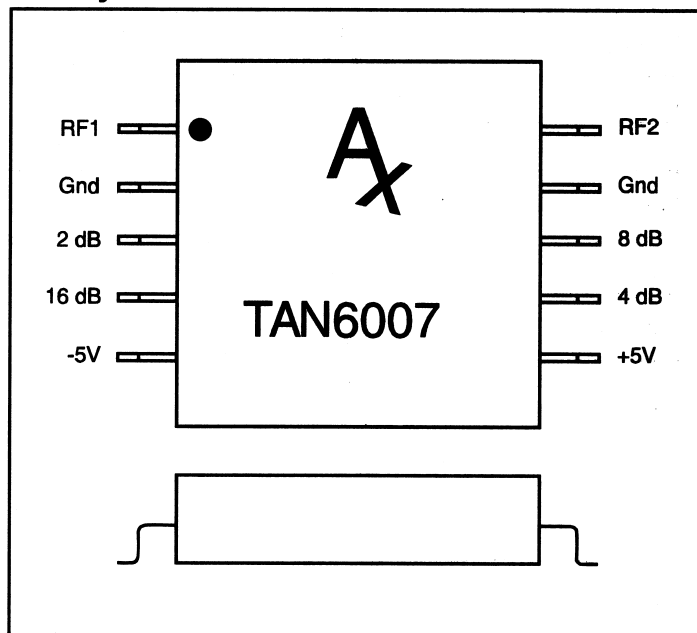
Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency		DC - 50 MHz	DC - 50 MHz
Insertion Loss (dB)		1.5	2.0 Max.
Attenuation Range (dB)		2 - 30	2 -30
Steps (dB)		2,4,8,16	2,4,8,16
Accuracy		±0.15 dB ±1%	±0.25 dB ±2% Max.
VSWR		1.3:1	1.4:1 Max.
Switching Speed (nsec)		20	30 Max.
Transients (mV)		300	350 Max.
DC Bias	VDC mA	+5 3	+5 5 Max.
DC Bias	VDC mA	- 5 3	- 5 5 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -65°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0, -6 Volts
 Continuous RF Input Power +30 dBm

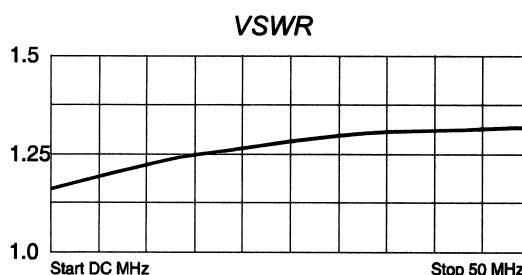
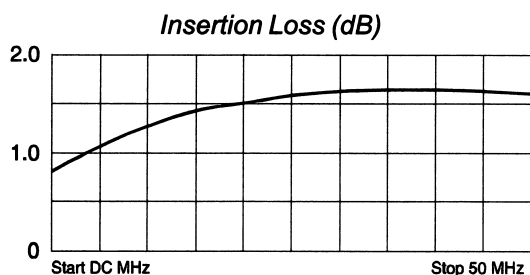
Pin Layout



Truth Table

Control Input 4 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

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4 BIT DIGITAL ATTENUATOR

TAN6008

Available in:

DP-5, 24 Pin DIP Package
and Connectorized Housings

- 50 - 500 MHz
- Fast Switching Speed: 20 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. -55°C to + 85°C
- Screening to the tables of MIL-STD-883 available

Specifications

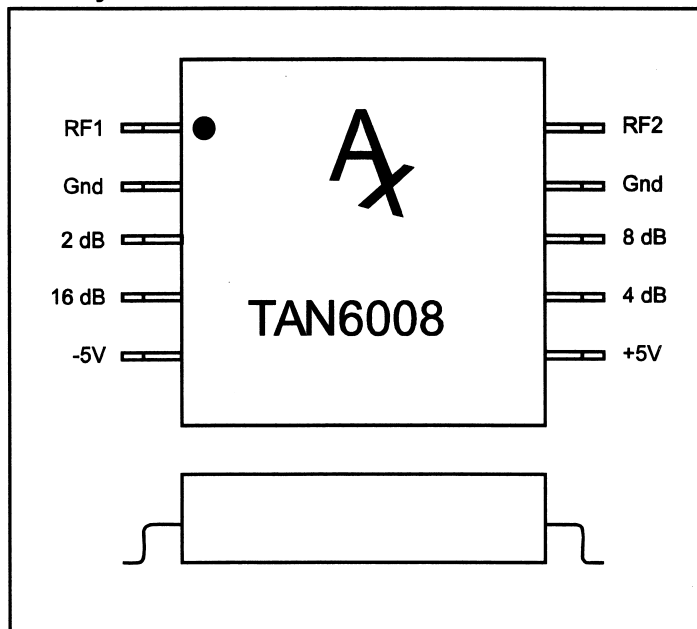
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency	50 - 500 MHz	50 - 500 MHz
Insertion Loss (dB)	2.0	3.3 Max.
Attenuation Range (dB)	2 - 30	2 -30
Steps (dB)	2,4,8,16	2,4,8,16
Accuracy	±0.15 dB ±1%	±0.25 dB Max. ±2%
VSWR	1.3:1	1.5:1 Max.
Switching Speed (nsec)	20	30 Max.
Transients (mV)	300	350 Max.
DC Bias	VDC mA	
	+5 3	+5 5 Max.
DC Bias	VDC mA	
	- 5 3	- 5 5 Max.

Note: Care should always be taken to effectively ground the case of each unit

Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -65°C to + 125 °C
Case Temperature + 125 °C
DC Voltage +6.0, -6Volts
Continuous RF Input Power +30 dBm

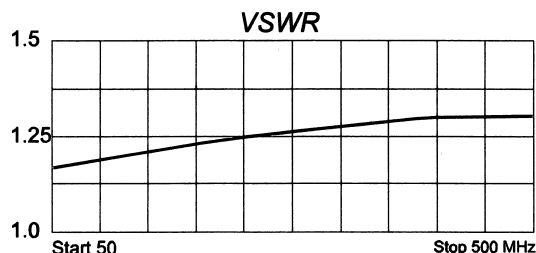
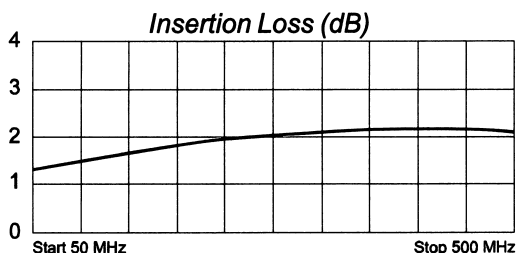
Pin Layout



Truth Table

Control Input 4 Line TTL	Attenuator Setting
1	Attenuate
0	Thru

Typical Performance Data



Amplifonix

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RF ATTENUATOR

MODEL TG9001

Available in: 5 Pin TO-8, Flatpack,
Surface Mount Flatpack, and
Connectorized Housings

Features

- 5 MHz to 2000 MHz
- Low Insertion Loss
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

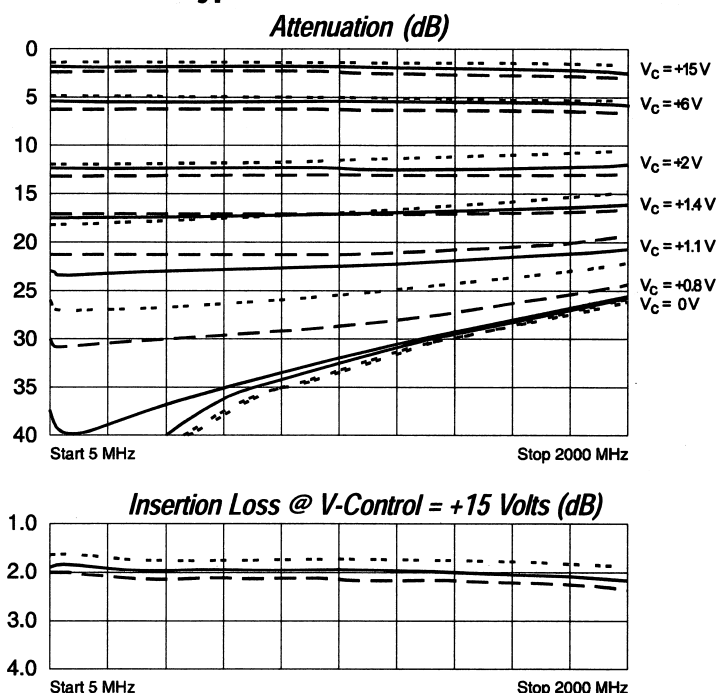
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (Vc = 15)		
5-500 MHz	2.0	2.3 Max.
5-1000 MHz (dB)	2.2	2.5 Max.
5-2000 MHz	2.5	3.5 Max.
Max Attenuation		
5-500 MHz	33	31 Min.
5-1000 MHz (dB)	27	25 Min.
5-2000 MHz	23	18 Min.
VSWR (Worst Case)		
5-500 MHz	1.75:1	2.0:1 Max.
5-1000 MHz (dB)	1.75:1	2.0:1 Max.
5-2000 MHz	2.2:1	2.2:1 Max.
Flatness over Freq.		
5-500 MHz	±0.15	±0.25 Max.
5-1000 MHz (dB)	±0.5	±1.0 Max.
5-2000 MHz	±0.7	±1.5 Max.
Bias Power	Vdc	
	mA	
	+15	+15
	5.5	10 Max.
Control Power	Vdc	
	mA	
	0 to +15	0 to +15
	5.5	0 to 7 Max.
Switching Speed (μsec)	40	60 Max.
10% to 90%		

Note: Care should always be taken to effectively ground the case of each unit.

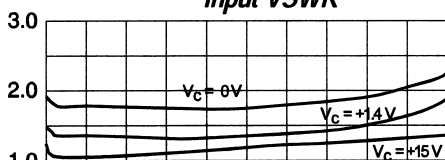
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
Storage Temperature -62°C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 18 Volts
Continuous RF Input Power + 20 dBm
Short Term RF Input Power 200 Milliwatts
..... (1 Minute Max.)
Maximum Peak Power..... 1 Watt
..... (3 μsec Max.)

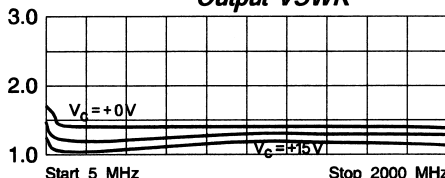
Typical Performance Data



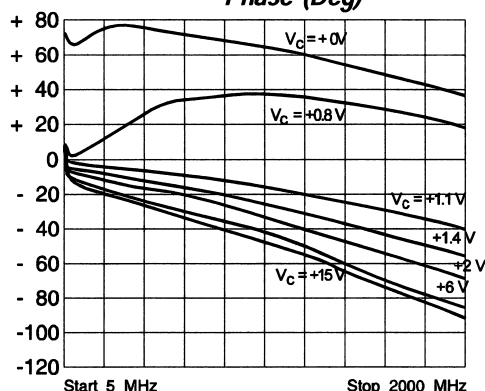
Input VSWR



Output VSWR



Phase (Deg)



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Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

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RF ATTENUATOR MODEL *TG9005*

PACKAGE: 5 Pin TO-8

Features

- 0.1 MHz to 1400 MHz Typical
- 31 dB Attenuation Range
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

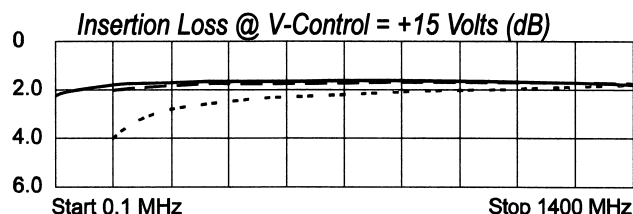
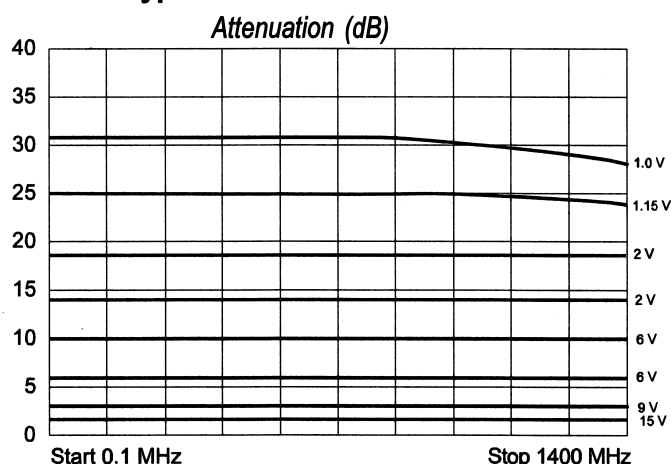
Specifications

CHARACTERISTIC	TYPICAL Ta= 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	0.1 - 1400 MHz	0.1 - 1400 MHz
Insertion Loss (Vc = 15)	2.0 dB	2.5 dB Max.
Max Attenuation		
5-500 MHz	31 dB	30 dB Min.
5-1400 MHz	26 dB	25 dB Min.
VSWR (Worst Case)		
5-500 MHz	<1.5:1	1.8:1 Max.
500-1400 MHz	<1.6:1	2.0:1 Max.
Flatness over Freq. 0.1-1400 MHz (dB)	±0.2	±0.5 Max.
Bias Power	Vdc	
	mA	
	+15	+18
	10	12 Max.
Control Power	Vdc	
	mA	
	0 to +15	0 to +15
	0 to 6	0 to 7.5

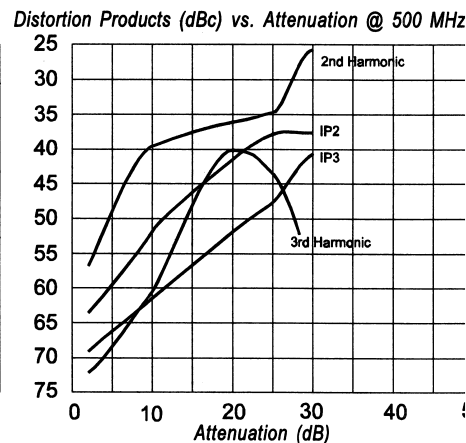
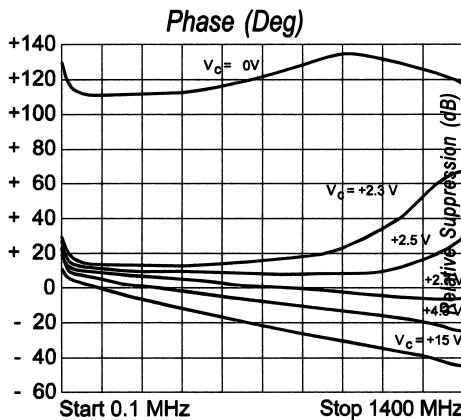
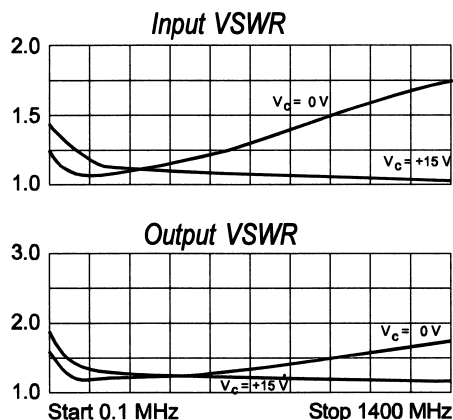
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 1 Watt
 (3 µsec Max.)

Typical Performance Data



Note: Care should always be taken to effectively ground the case of each unit.



Legend ——— + 25 °C - - - - + 85 °C - - - - -55 °C

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RF ATTENUATOR

MODEL TG9006

Available in: 5 Pin TO-8, Flatpack,
Surface Mount Flatpack, and
Connectorized Housings

Features

- 5 MHz to 1600 MHz
- Low Insertion Loss
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	5 - 1600 MHz	5 - 1600 MHz
Insertion Loss (Vc = 15)		
5-500 MHz	2.0	2.3 Max.
5-1000 MHz (dB)	2.2	2.5 Max.
5-2000 MHz	2.5	3.5 Max.
Max Attenuation		
5-500 MHz	33	31 Min.
5-1000 MHz (dB)	27	25 Min.
5-2000 MHz	23	18 Min.
VSWR (Worst Case)		
5-500 MHz	1.75:1	2.0:1 Max.
5-1000 MHz (dB)	1.75:1	2.0:1 Max.
5-2000 MHz	2.2:1	2.5:1 Max.
Flatness over Freq.		
5-500 MHz	±0.15	±0.25 Max.
5-1000 MHz (dB)	±0.5	±1.0 Max.
5-2000 MHz	±0.7	±1.5 Max.
Bias Power	Vdc	+12
	mA	5.5
		10 Max.
Control Power	Vdc	0 to +12
	mA	6.5
		0 to 7 Max.
Switching Speed (µsec)	40	60 Max.

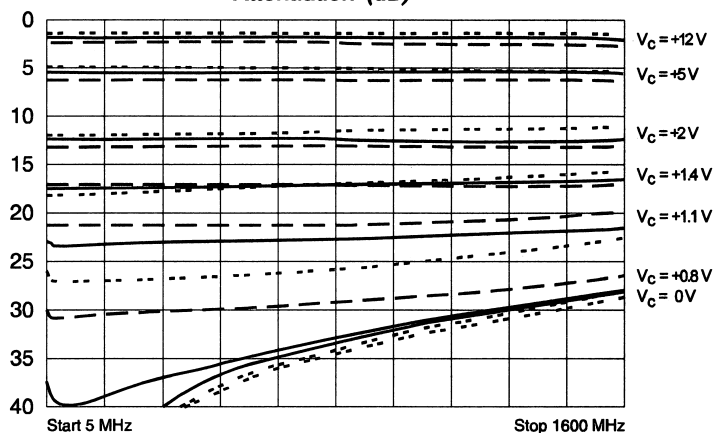
Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

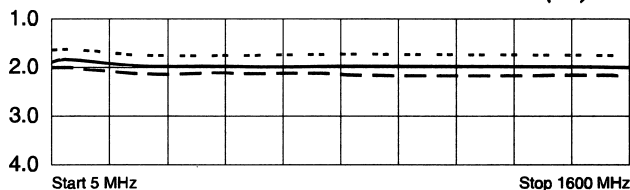
Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 1 Watt
 (3 µsec Max.)

Typical Performance Data

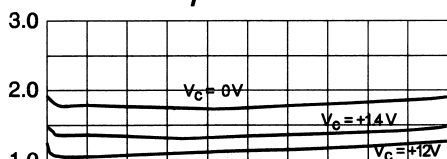
Attenuation (dB)



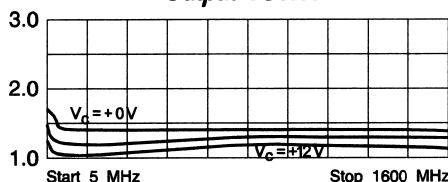
Insertion Loss @ V-Control = 12 Volts (dB)



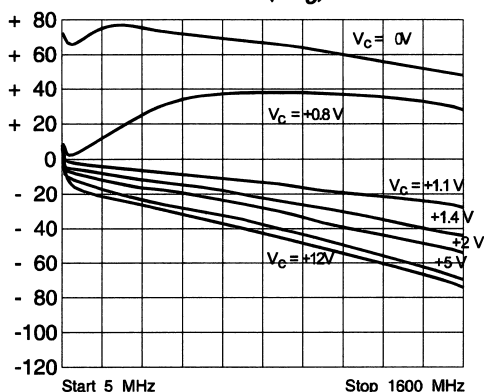
Input VSWR



Output VSWR



Phase (Deg)



Legend ——— + 25 °C - - - + 85 °C - - - - -55 °C

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RF ATTENUATOR MODEL TG9015

Package: 5 Pin TO-8 (T5)
Also Available in: Flatpack, Surface Mount and Connectorized Housings

Features

- * Negative Control Voltage: 0 to -10 Volts
- * > 20 dB Attenuation Typical
- * Operating Temp. 0 C to +50 C
- * Environmental Screening available

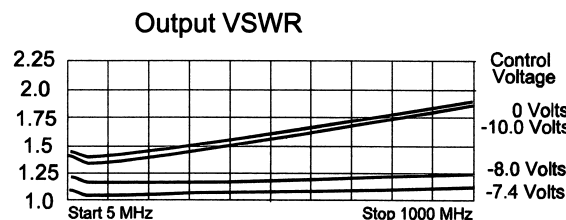
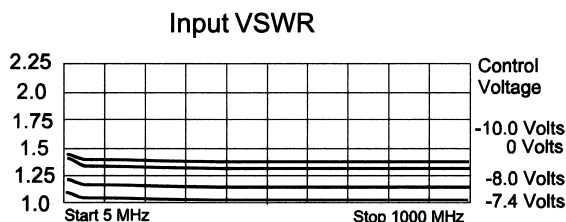
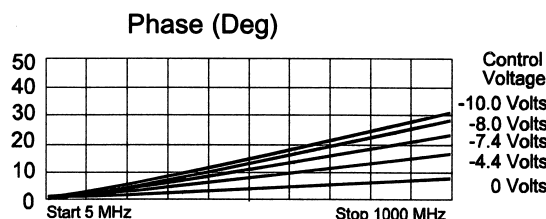
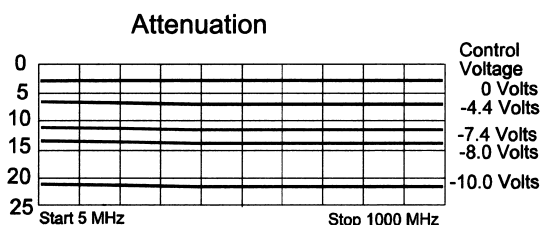
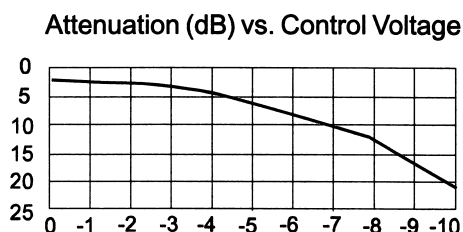
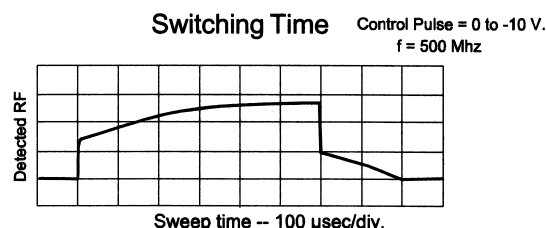
Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = 0 °C to +50 °C
Frequency	5 - 1000 MHz	5 - 1000 MHz
Insertion Loss (Vc=0V) 5-500 MHz 500-1000 MHz (dB)	1.5 2.0	2.0 Max. 2.5 Max.
Max Attenuation (dB) (Vc = -10V)	20	15 Min.
VSWR (worst Case In Attenuation Range) In Out	<1.5:1 <1.75:1	2.0:1 Max. 2.0:1 Max.
Flatness over Freq.	±0.5 dB	±0.75 dB Max.
Switching Speed (ms) 10% to 90%	0.5	0.75 Max.
Bias Power Vdc mA	+ 15 7	+ 15 10 Max.
Control Power Vdc mA	0 to -10 0 to 7	0 to -10 0 to 10 Max.

Maximum Ratings

Ambient Operating Temperature -55°C to + 125 °C
Storage Temperature -62°C to + 150 °C
Case Temperature + 150 °C
DC Voltage + 18 Volts
Control Voltage -15 Volts
Continuous RF Input Power +23 dBm

Typical Performance Data @ 25° C



Legend ——— + 25 °C - - - + 50 °C - - - - 0 °C

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RF ATTENUATOR MODEL *TG9030*

PACKAGE: 5 Pin TO-8

Features

- 100 MHz to 2000 MHz Typical
- 40 dB Attenuation Range to 1000 MHz
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Specifications

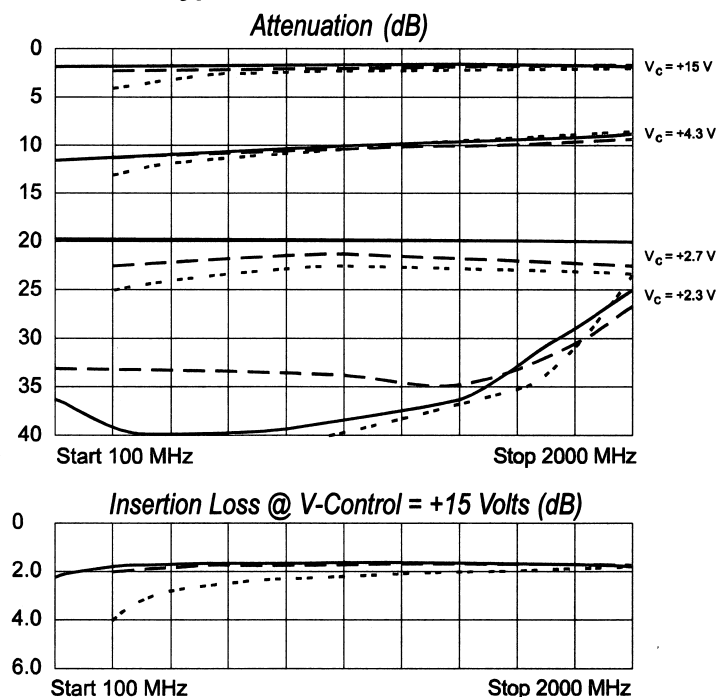
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = -55 °C to +85 °C
Frequency (MHz)	100 - 2000 MHz	300 - 2000 MHz
Insertion Loss (Vc = 15)		
100-500 MHz	<2.2	4.0 Max.
500-1000 MHz (dB)	<1.8	3.0 Max.
1000-2000 MHz	<2.0	2.5 Max.
Max Attenuation		
100-500 MHz	<45	40 Min.
500-1000 MHz (dB)	<40	35 Min.
1000-2000 MHz	<30	20 Min.
VSWR (Worst Case)		
100-300 MHz	2.0:1	3.0:1 Max.
300-2000 MHz	<2.5:1	
Output		
100-300 MHz	<2.0:1	2.0:1 Max.
300-2000 MHz	<1.75:1	
Flatness over Freq.		
5-500 MHz	±0.5	±3.0 Max.
5-1000 MHz (dB)	±1	±2.0 Max.
Bias Power	Vdc	
	mA	
	+15	+15
	8	10 Max.
Control Power	Vdc	
	mA	
	0 to +15	0 to +15
	0 to 6.5	0 to 10 Max.
Switching Speed (nsec)	<200	400 Max.
10% to 90%		

Note: Care should always be taken to effectively ground the case of each unit.

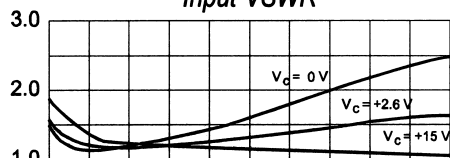
Maximum Ratings

Ambient Operating Temperature -55°C to + 100 °C
 Storage Temperature -62°C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 18 Volts
 Continuous RF Input Power + 20 dBm
 Short Term RF Input Power 200 Milliwatts
 (1 Minute Max.)
 Maximum Peak Power 1 Watt
 (3 µsec Max.)

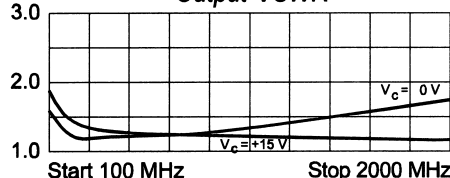
Typical Performance Data



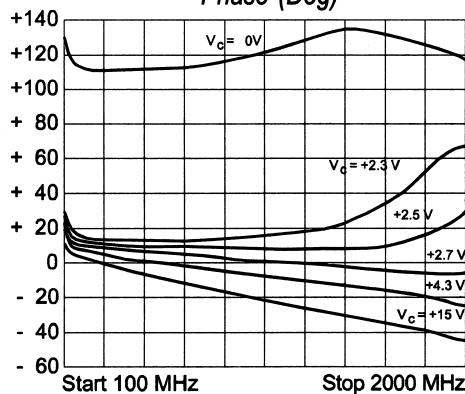
Input VSWR



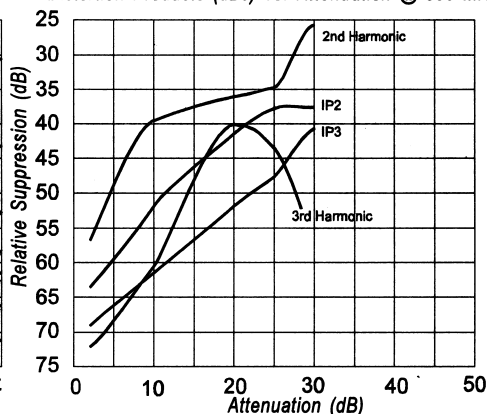
Output VSWR



Phase (Deg)



Distortion Products (dBc) vs. Attenuation @ 500 MHz



Legend ——— + 25 °C - - - - + 85 °C - - - - - - - - - -55 °C

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Linearizers

When coupled with a TG9001 (or similar voltage variable attenuator), Linearizers change the attenuation versus control voltage curve to a linear function. Available in 5 pin TO-8 and 12 pin TO-8B as well as Flatpacks, Surface Mount Packages and Connectorized Housings.

Model	Frequency Range (MHz)	Bias		Min. Attenuation @Vcon = -10 volts (Typ.)	Max. Attenuation @Vcon = -1 volt (Typ.)	Linearity Over Min/Max Attenuation Range (Typ.) (Typ.)	
		+V	-V			(Typ.)	(Typ.)
TL9003	10 to 1000	+15	-15	3 dB	20 dB	<+ 1dB	+2 dB
TL9007	10 to 1000	+12	-12	3 dB	20 dB	<+ 1dB	+2 dB

Direct Crosses to Other Manufacturer's Parts

W-J, M/A-Com	Amplifonix
G-1	TG9001
G-2	TG9022

Linearized Attenuator

Linearized Attenuators change the attenuation versus tuning voltage curve to a linear function. Available in 5 pin TO-8 and 12 pin TO-8B as well as Flatpacks, Surface Mount Packages and Connectorized Housings.

Model	Frequency Range (MHz)	Bias		Min. Attenuation @Vcon = -10 volts (Typ.)	Max. Attenuation @Vcon = -1 volt (Typ.)	Linearity Over Min/Max Attenuation Range (Typ.) (Typ.)	
		+V	-V			(Typ.)	(Typ.)
TGLR9025	5 to 2000	+15	-15	6 dB	40 dB	<+ 1dB	+2 dB

**Please visit our website for the most recent additions to our
line of Attenuators and Linearizers**

www.amplifonix.com

RF HYBRID LINEARIZERS TL9003

Available as: TNL9003, 4 Pin Surface Mount (SM3)
FPL9003, 4 Pin Flatpack (FP4)
BXL9003, Connectorized Housing (H1)

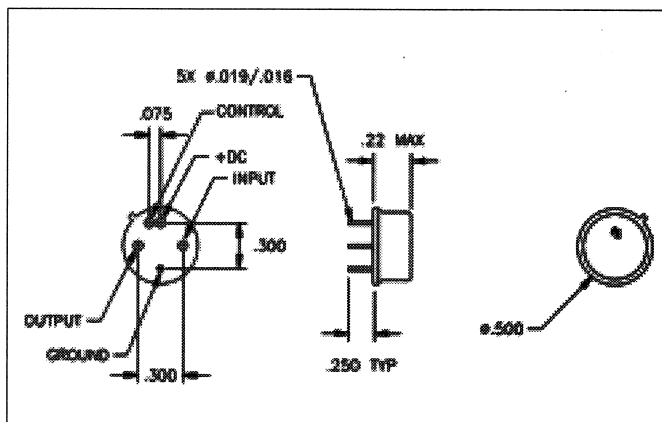
Features

- 10-1000 MHz Linearizer for TG9001
- 2.5 dB Change Per Control Volt.
- Specifications Guaranteed
- 5 Pin TO-8 Metal Hermetic Package
- Operating Temp. -55 °C to + 100 °C

Specifications

10 - 1000 MHz

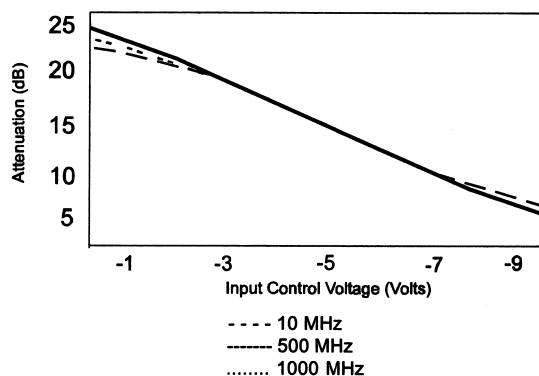
LINEARITY	TYP	MAX
3 - 20 dB	< + 1 dB	< + 2 dB



TYPICAL POWER TL9003

	Max Attn.	Min Attn.
POWER SUPPLY	Vcon = -1	Vcon = -10
+ 15 Vdc + 1%	4 mA	6 mA
- 15 Vdc + 1%	4 mA	7 mA
Vcon	2 mA	3 mA

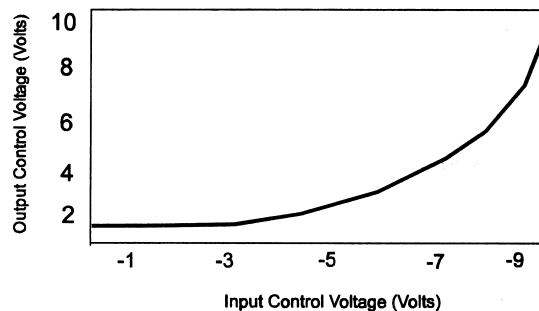
Attenuation TG9001, TG9003 vs. Input Control Voltage



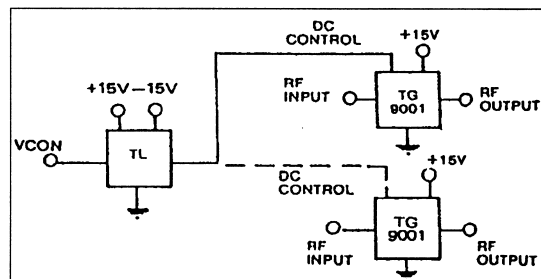
TYP. POWER TL9003 & TG9001 CASCADED

	Max Attn.	Min Attn.
POWER SUPPLY	Vcon = -1	Vcon = -10
+ 15 Vdc + 1%	10 mA	16 mA
- 15 Vdc + 1%	4 mA	7 mA
Vcon	2 mA	3 mA

Output Voltage vs. Input Voltage



Note: Care should always be taken to effectively ground the case of each unit.



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RF HYBRID LINEARIZER TL9007

Available as: TNL9007, 4 Pin Surface Mount (SM3)
FPL9007, 4 Pin Flatpack (FP4)
BXL9007, Connectorized Housing (H1)

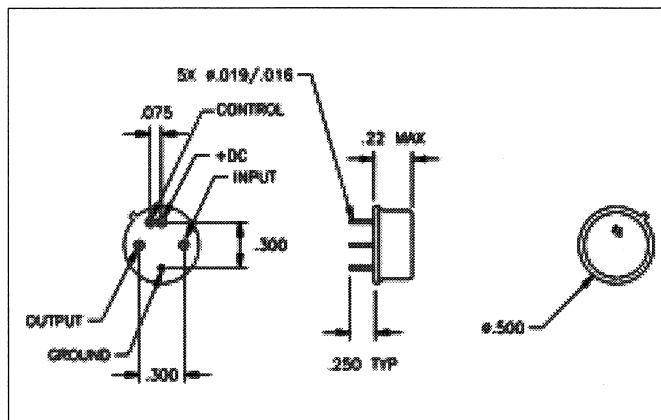
Features

- 10-1000 MHz Linearizer for TG9001
- 2.5 dB Change Per Control Volt.
- Specifications Guaranteed
- 5 Pin TO-8 Metal Hermetic Package
- Operating Temp. -55 °C to + 100 °C

Specifications

10 - 1000 MHz

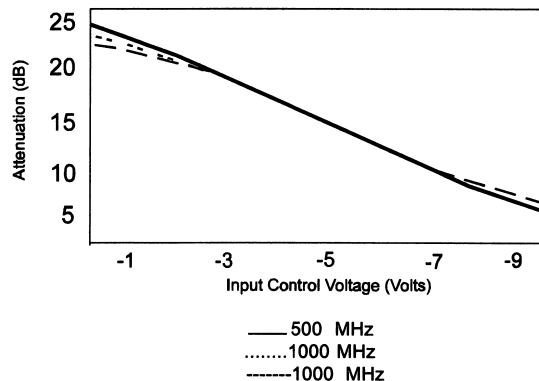
LINEARITY	TYP	MAX
3 - 20 dB	< + 1 dB	< + 2 dB



TYPICAL POWER TL9007

	Max Attn.	Min Attn.
POWER SUPPLY	Vcon = -1	Vcon = -10
+ 12 Vdc + 1%	4 mA	6 mA
- 12 Vdc + 1%	4 mA	7 mA
Vcon	2 mA	3 mA

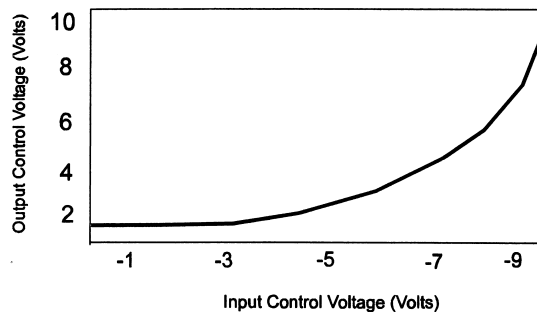
Attenuation TG9001, TG9007 vs. Input Control Voltage



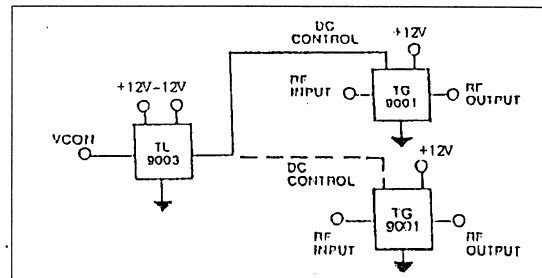
TYP. POWER TL9007 & TG9001 CASCADED

	Max Attn.	Min Attn.
POWER SUPPLY	Vcon = -1	Vcon = -10
+ 12 Vdc + 1%	10 mA	16 mA
- 12 Vdc + 1%	4 mA	7 mA
Vcon	2 mA	3 mA

Output Voltage vs. Input Voltage



Note: Care should always be taken to effectively ground the case of each unit.



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RF ATTENUATOR MODEL TGLWN9025

Package Style: SG4 Surface Mount - Gull Wing
Available as: 4 Pin TO-8B

Features

- Linearized; 5 - 1000 MHz
- Attenuation Slope: 5 dB per Volt
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Specifications

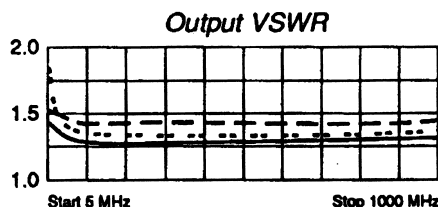
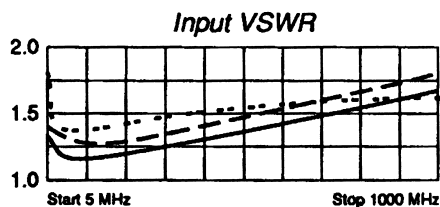
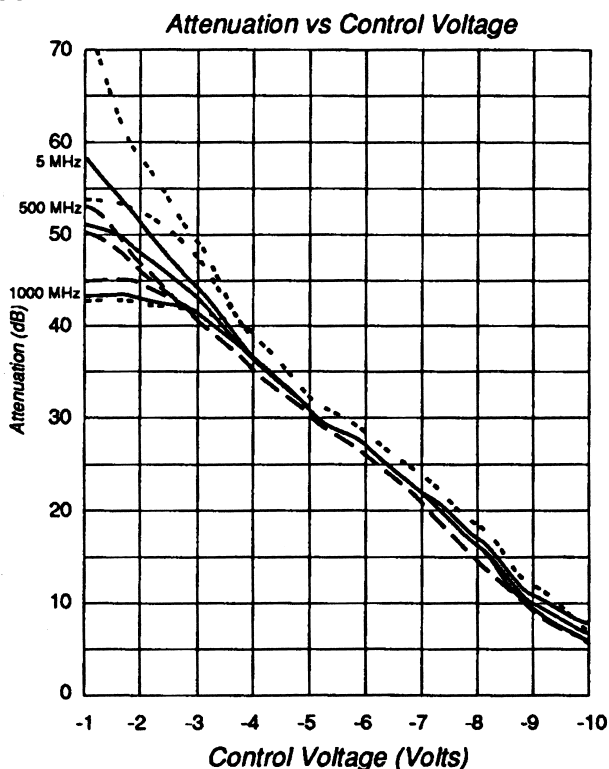
CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C	
Frequency		5 - 1000 MHz	5 - 1000 MHz	
Linearity				
6 - 51 dB	5 MHz	< ± 2 dB	± 4 dB	Max.
6 - 48 dB	500 MHz	< ± 2 dB	± 4 dB	Max.
6 - 42 dB	1000 MHz	< ± 2 dB	± 4 dB	Max.
VSWR (Worst Case)				
5-500 MHz		< 1.5:1	2.0:1	Min.
5-1000 MHz (dB)		< 1.75:1	2.0:1	Min.
Bias Power	Vdc mA	+15 22	+15 30	Max.
Bias Power	Vdc mA	- 15 3	- 15 5	Max.
Control Power	Vdc mA	-1 to -10 1.25 to 2.5	-1 to -10 0.75 to 4	Max.
Switching Speed (μs)		50	120	Max.
10% to 90%				

Note: Care should always be taken to effectively ground the case of each unit.

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 62 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage ± 18 Volts
Continuous RF Input Power + 23 dBm
Short Term RF Input Power 500 Milliwatts
(1 Minute Max.)
Maximum Peak Power 1 Watt
(3 μsec Max.)

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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Rev. A 01/09/03

Switches - PIN Diode

The units are available in many package configurations with up to eight (8) throws.
Control is obtained through TTL Logic.

Model	Type (Throws)	Frequency Range (MHz)	Insertion Loss (Typ.) (Max.)	Isolation (Typical)	Switching Speed (μ s)	Termination	Control	Package	Power Volts (DC) Current (mA)	
TWM5000	SPST	10 to 1500	1.0 1.5	50	0.5	50 Ohms	TTL	T-5	(+5V)	5
TWD5001	SPDT	10 to 1000	1.0 2.0	45	4	50 Ohms	TTL	DP-3	(+15V)	15
TWD5015	SPDT	20 to 1000	1.2 2.0	45	0.7	50 Ohms	TTL	DP-3	(+5V)	15
TWD5002	SPDT	30 to 1000	0.9 1.8	70	1	50 Ohms	TTL	DP-11	(+5/-5V)	18/12
TWH7230	SPDT	10 to 3000	1.0 1.5?	70	2	Open	TTL	T-9	(+4.5 to 5.5V)	2.4
TWH5016	SP3T	10 to 3000	1.0 1.5?	70	2	Open	TTL	T-9	(+4.5 to 5.5V)	2.4
TWH7425	SP4T	10 to 3000	1.0 1.5	70	2	Open	TTL	T-9	(+4.5 to 5.5V)	2.4
TWH5017	SP5T	10 to 3000	1.0 1.5	70	2	Open	TTL	T-9	(+4.5 to 5.5V)	2.4
TWD5005	SP8T	30 to 500	1.2 1.8	55	1	50 Ohms	TTL	DP-5	(+5/-5V)	20/5

Cross Reference List

Amplifonix also offers an extensive Drop-in Replacement list on dozens of older and many times obsolete Anzac, Adams Russell and M/A-Com switches.

ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX	ANZAC	AMPLIFONIX
SW203	TWK2203	SW217	TWD2217	SW241	TWD2241	SW255	TWD2255
SW204	TKP2204	SW218	TWD2218	SW242	TWD2242	SW257	TWD2257
SW205	TWD2205	SW219	TWP2219	SW244	TWD2244	SW258	TWD2258
SW206	TWD2206	SW224	TWK2224	SW245	TWD2245	SW261	TWP2261
SW209	TWP2209	SW231	TWP2231	SW247	TWP2247	SW262	TWP2262
SW213	TWK2213	SW232	TWP2232	SW248	TWP2248	SW264	TWP2264
SW214	TWP2214	SW233	TWP2233	SW251	TWP2251	SW265	TWP2265
SW215	TWD2215	SW234	TWP2234	SW252	TWP2252	SW278	TWN2278
SW216	TWD2216	SW238	TWP2238	SW254	TWD2254		

Please visit www.amplifonix.com for the latest developments in High Isolation Switch design.

Switches – GaAs

These circuits operate from DC to 3 GHz and use GaAs MMIC switches to control the RF signal path. They are available with or without TTL or CMOS drivers. They should be used in place of PIN Diode switches when fast switching speed and low DC Power consumption is important.

Model	Type	Frequency Range (MHz)		Insertion Loss	Isolation typ.	Switching Speed (ns)	VSWR (typ.)	Termination	Driver	Package
TWM6001	SPST	10	1500	1.2	500	35	1.25:1	50	TTL	T-5
TWR6000	SPST	10	1500	2.5	30	80	1.25:1	OPEN	TTL	T-8
TWN6002	SPST	10	2000	1.2	30	35	1.25:1	50	TTL	SM-2
TWP2214	SPST	DC	3000	0.7	10	55	1.15:1	50	0/-5V	FP-12
TWK2213	SPST	DC	3000	0.7	10	55	1.15:1	50	0/-5V	T-2
TWP2209	SPST	DC	3000	1	6	40	1.25:1	50	0/-5V	FP-7
TWN2278	SPST	DC	3000	0.9	10	55	1.1:1	50	0/-5V	SM-2
TWP2231	SPST	5	3000	1	30	55	1.2:1	50	TTL	FP-13
TWP2232	SPST	5	3000	1	60	55	1.2:1	50	CMOS	FP-13
TWD2215	SPST	5	3000	1	30	60	1.2:1	50	TTL	DP-3
TWD2216	SPST	5	3000	1	60	60	1.2:1	50	CMOS	DP-3
TWP2225	SPDT	DC	2000	0.6	25	35	1.1:1	OPEN	TTL	FP-12
TWK2224	SPDT	DC	2000	0.6	25	40	1.15:1	OPEN	TTL	T-2
TWP2233	SPDT	5	2000	1	30	50	1.2:1	50	TTL	FP-13
TWP2234	SPDT	5	2000	1	30	55	1.2:1	OPEN	TTL	FP-13
TWD2217	SPDT	5	2000	1	30	55	1.2:1	OPEN	TTL	DP-3
TWD2218	SPDT	5	2000	1	60	55	1.2:1	OPEN	CMOS	DP-3
TWD2206	SPDT	5	3000	1.2	60	55	1.2:1	50	CMOS	DP-3
TWP2219	SPDT	DC	3000	0.5	10	40	1.15:1	OPEN	0/-5V	FP-7
TWK2201	SPDT	DC	3000	0.5	25	50	1.15:1	OPEN	0/-5V	T-2
TWP2202	SPDT	DC	3000	0.5	10	50	1.15:1	OPEN	0/-5V	FP-12
TWD2208	SPDT	DC	3000	0.8	60	45	1.2:1	OPEN	CMOS	DP-3
TWD2207	SPDT	DC	3000	0.8	30	45	1.2:1	OPEN	TTL	DP-3
TWK2203	SPDT	DC	3000	0.8	15	50	1.15:1	50	0/-5V	T-2
TWP2204	SPDT	DC	3000	0.8	10	50	1.15:1	50	0/-5V	FP-12
TWD2205	SPDT	5	3000	1.2	30	55	1.2:1	50	TTL	DP-3
TWP2248	SP3T	5	2000	1	20	55	1.2:1	OPEN	TTL	FP-14
TWD2247	SP3T	5	2000	1	20	55	1.2:1	50	TTL	FP-14
TWP2251	SP3T	5	2000	1	40	55	1.2:1	50	CMOS	FP-14
TWD2241	SP3T	5	2000	1	20	50	1.2:1	50	TTL	DP-10
TWD2242	SP3T	5	2000	1	20	60	1.2:1	OPEN	TTL	DP-10
TWD2244	SP3T	5	2000	1	40	60	1.2:1	50	CMOS	DP-10
TWP2262	SP4T	5	2000	1	20	55	1.2:1	OPEN	TTL	FP-14
TWP2261	SP4T	5	2000	1	20	55	1.2:1	50	TTL	FP-14
TWP2264	SP4T	5	2000	1	40	55	1.2:1	50	CMOS	FP-14
TWD2255	SP4T	5	2000	1	20	55	1.2:1	OPEN	TTL	DP-10
TWD2257	SP4T	5	2000	1	40	55	1.2:1	50	CMOS	DP-10
TWD6018	SP4T	5	3000	1.4	20	50	1.5:1	50	TTL	DP-11

SPDT RF SWITCH MODEL TWK2201

Package: 8 Pin TO-5 (T2)

Also Available in: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 12 ns Typical
- RF1, RF2 Reflective in 'OFF' State
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

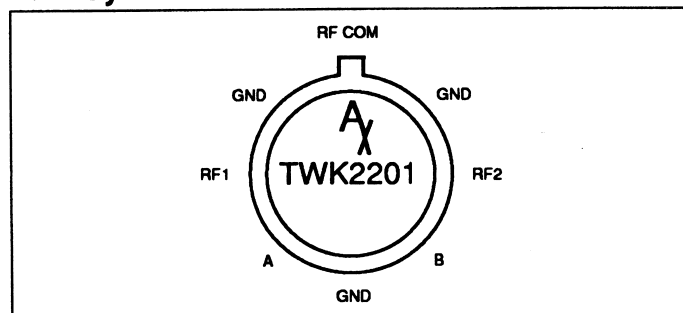
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage - 8.5 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	1.0	1.3 Max.
Isolation (dB)	≥ 30	21 Min.
VSWR	"ON" "OFF"	2.0:1 Max. 2.0:1 Max.
Control Input High	Vdc mA	- 5.0 to - 8.0 0.30
Control Input Low	Vdc mA	0 to - 0.2 0.010
Switching Speed (nsec)	12	25 Max.

Note: Care should always be taken to effectively ground the case of each unit

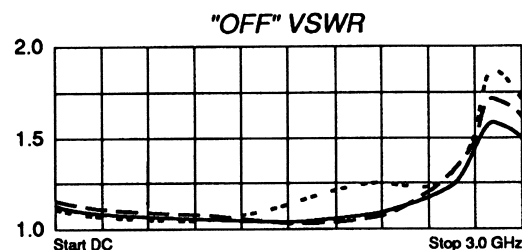
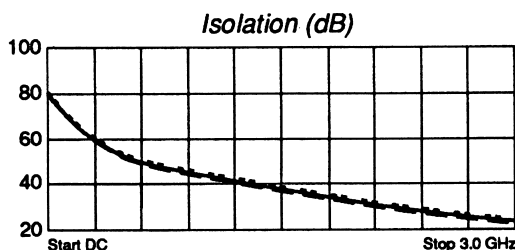
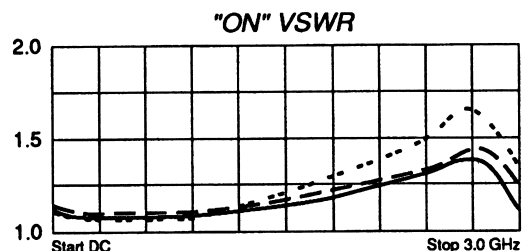
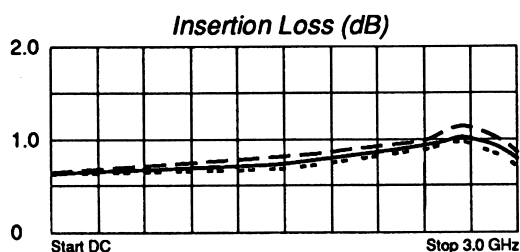
Pin Layout



Truth Table

Control Input		Switch State	
		RF Common to:	
A	B	RF1	RF2
High	Low	ON	OFF
Low	High	OFF	ON

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SPDT RF SWITCH

MODEL TWP2202

Package: 6 Lead Flatpack (FP12)
Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 6 ns Typical
- RF1, RF2 Reflective in 'OFF' Position
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

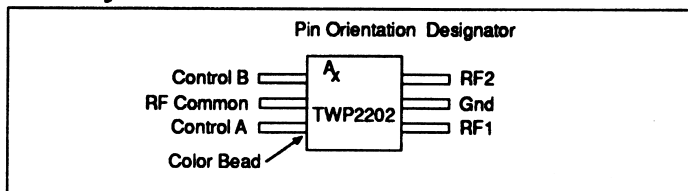
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage - 8.5 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency		DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)		1.0	1.4 Max.
Isolation (dB)		≥ 30	23 Min.
VSWR	In	<1.4:1	1.5:1 Max.
	Out	<1.4:1	1.5:1 Max.
Control Input High	Vdc	- 5.0 to - 8.0	- 8.0 Max.
	mA	0.30	1.00 Max.
Control Input Low	Vdc	0 to - 0.2	0 Max.
	mA	0.010	0.030 Max.
Switching Speed (nsec)		6	10 Max.

Note: Care should always be taken to effectively ground the case of each unit

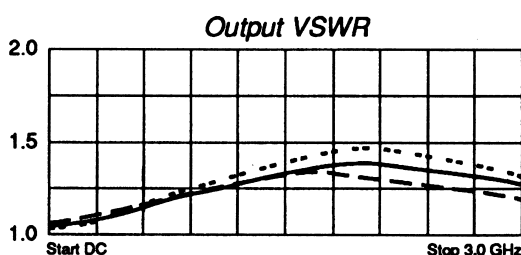
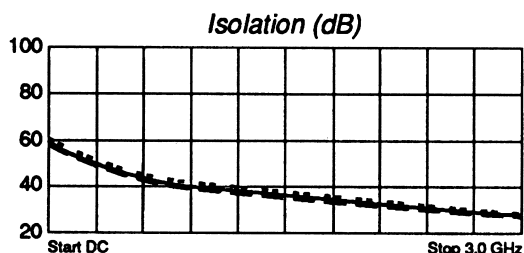
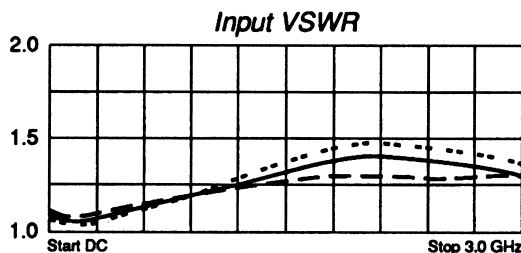
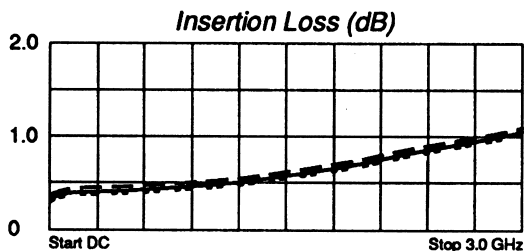
Pin Layout



Truth Table

Control Input		Switch Position	
		RF Common to:	
A	B	RF1	RF2
High	Low	ON	OFF
Low	High	OFF	ON

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SPDT RF SWITCH MODEL TWK2203

Package: 8 Pin TO-5 (T2)

Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 9 ns Typical
- RF1, RF2 Terminated in 'OFF' Position
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

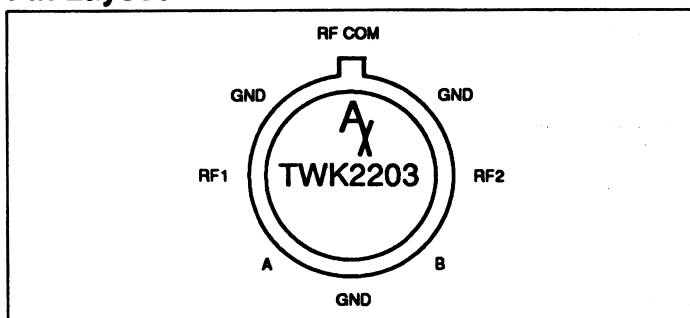
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage - 8.5 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	1.0	2.0 Max.
Isolation (dB)	≥ 40	30 Min.
VSWR "ON"	<1.5:1	2.0:1 Max.
VSWR "OFF"	<1.75:1	2.0:1 Max.
Control Input High Vdc mA	- 5.0 to - 8.0 0.30	- 8.0 Max. 1.00 Max.
Control Input Low Vdc mA	0 to - 0.2 0.010	0 Max. 0.030 Max.
Switching Speed (nsec)	9	15 Max.

Note: Care should always be taken to effectively ground the case of each unit

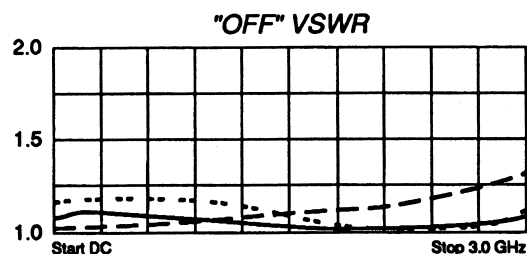
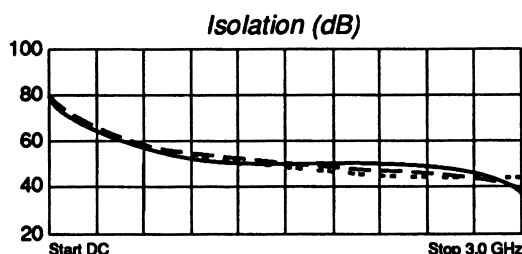
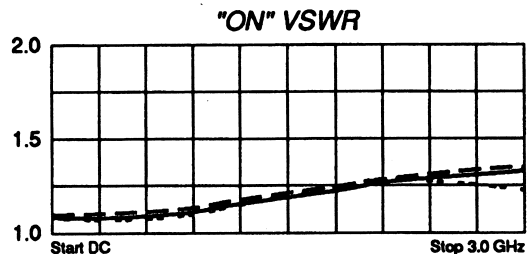
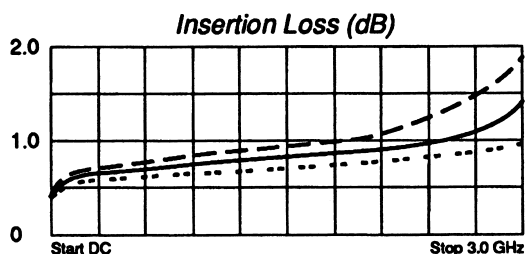
Pin Layout



Truth Table

Control Input		Switch Position	
		RF Common to:	
A	B	RF1	RF2
High	Low	ON	OFF
Low	High	OFF	ON

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SPDT RF SWITCH

MODEL TWP2204

Package: 6 Lead Flatpack (FP12)
Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 6 ns Typical
- RF1, RF2 Terminated in 'OFF' Position
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

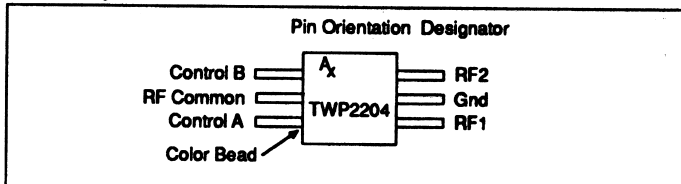
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage - 8.5 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	1.0	1.5 Max.
Isolation (dB)	≥ 40	30 Min.
VSWR	In Out	2.0:1 Max. 2.0:1 Max.
Control Input High	Vdc mA	- 5.0 to - 8.0 0.30
Control Input Low	Vdc mA	0 to - 0.2 0.010
Switching Speed (nsec)	6	10 Max.

Note: Care should always be taken to effectively ground the case of each unit

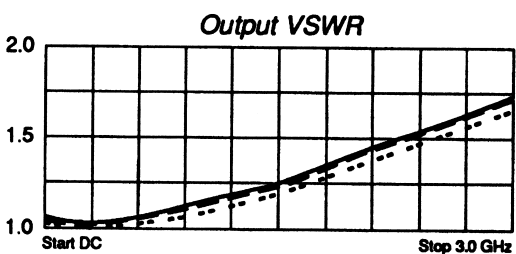
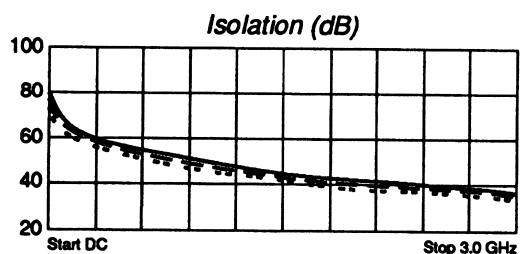
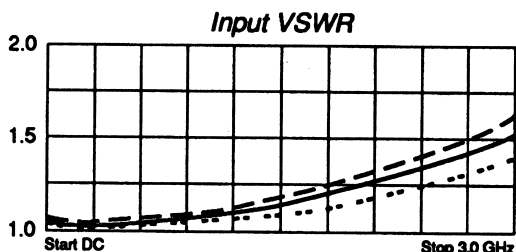
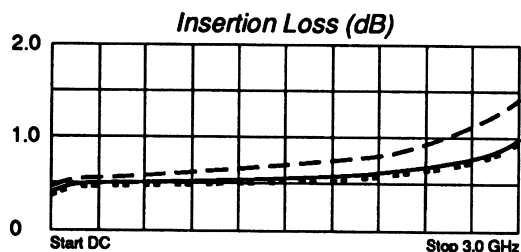
Pin Layout



Truth Table

Control Input		Switch Position	
		RF Common to:	
A	B	RF1	RF2
High	Low	ON	OFF
Low	High	OFF	ON

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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Rev. B 11/09/93

SPDT RF SWITCH MODEL TWD2206

Package: 14 Pin DIP (DP3)

Also Available In: Connectorized Housings

Features

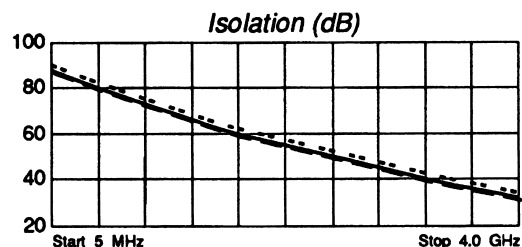
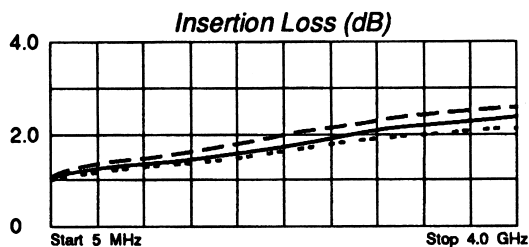
- 5 - 4000 MHz
- RF1, RF2 Terminated in 'OFF' State
- Integral CMOS Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +85 °C
Frequency	5 - 4000 MHz	5 - 4000 MHz
Insertion Loss (dB)		
5 - 1000 MHz	1.5	1.8 Max.
5 - 2000 MHz	1.9	2.2 Max.
5 - 3000 MHz	2.5	2.8 Max.
Isolation (dB)		
5 - 1000 MHz	65	60 Min.
5 - 2000 MHz	55	50 Min.
5 - 3000 MHz	32	30 Min.
VSWR "ON"/"OFF"		
5 - 1000 MHz	1.25:1	1.5:1 Max.
5 - 2000 MHz	1.6:1	2.0:1 Max.
5 - 3000 MHz	1.6:1	2.0:1 Max.
1 dB Compression (dBm)		
50 MHz	+18.5	+18.0 Min.
500 - 3000 MHz	+24	+22.0 Min.
Switching Speed (nsec) (50% TTL to 90% RF)	40	60 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	0.025	1.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

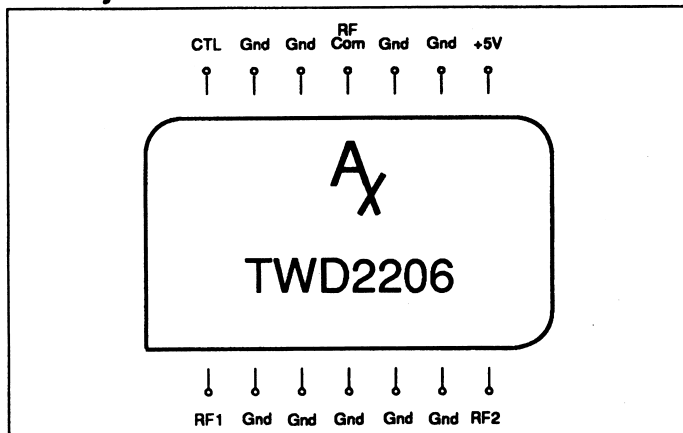
Typical Performance Data



Maximum Ratings

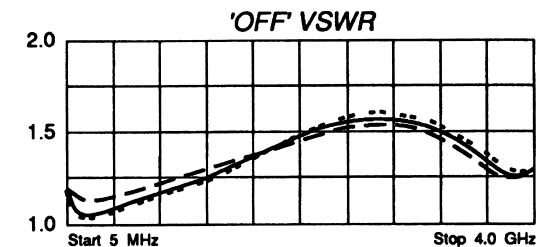
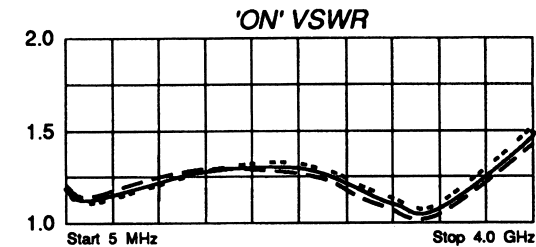
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +30 dBm

Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To
0	RF1
1	RF2



Legend ——— + 25 °C - - - - +85 °C - 55 °C

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SPST RF SWITCH MODEL TWP2209

Package: 8 Lead Flatpack (FP7)

Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 6 ns Typical
- RF2 Terminated in 'OFF' Position
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

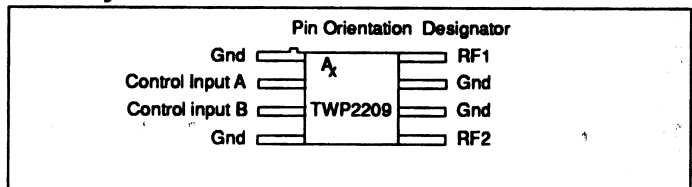
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage - 8.5 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	1.0	1.5 Max.
Isolation (dB)	≥ 32	30 Min.
VSWR In Out	<1.25:1 <1.25:1	1.6:1 Max. 1.5:1 Max.
Control Input High Vdc mA	- 5.0 to - 8.0 0.150	- 8.0 Max. 0.500 Max.
Control Input Low Vdc mA	0 to - 0.2 0.010	0 Max. 0.030 Max.
Switching Speed (nsec)	6	10 Max.

Note: Care should always be taken to effectively ground the case of each unit

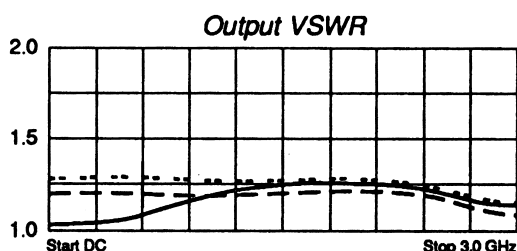
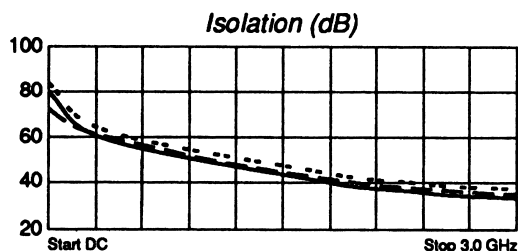
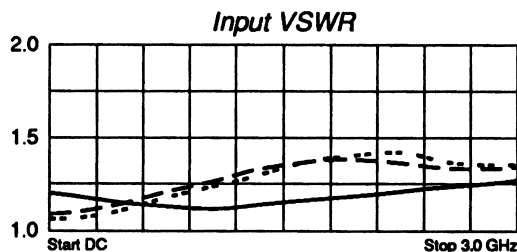
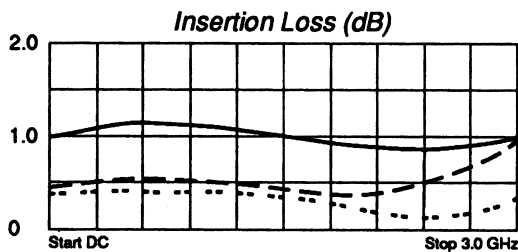
Pin Layout



Truth Table

Control Input		Switch Position
A	B	RF1 to RF2
High	Low	ON
Low	High	OFF

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

Amplifonix

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Rev. A 11/10/01

SPST RF SWITCH MODEL TWP2214

Package: 6 Lead Flatpack (FP12)

Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 6 ns Typical
- RF2 Terminated in 'OFF' Position
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

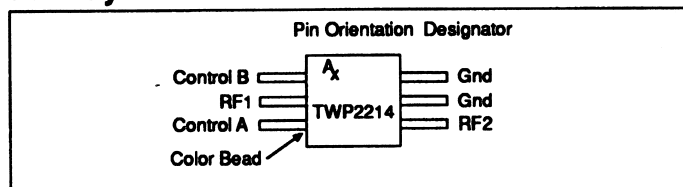
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage - 8.5 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	0.8	1.3 Max.
Isolation (dB)	≥ 40	27 Min.
VSWR	In Out	1.8:1 Max. 1.8:1 Max.
Control Input High	Vdc mA	- 5.0 to - 8.0 0.05
Control Input Low	Vdc mA	0 to - 0.2 0.010
Switching Speed (nsec)	6	10 Max.

Note: Care should always be taken to effectively ground the case of each unit

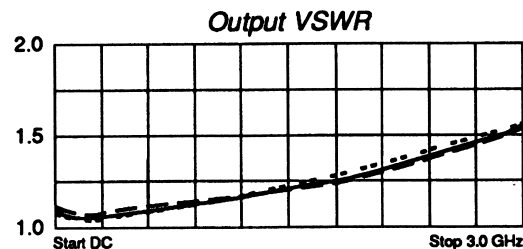
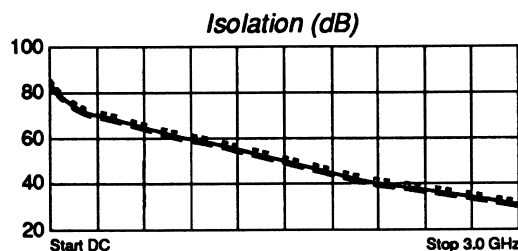
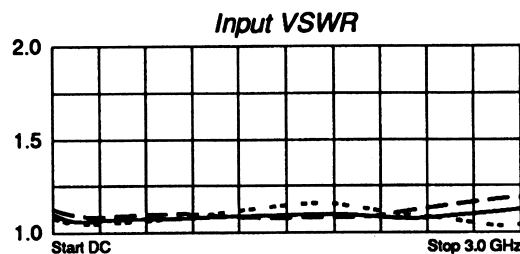
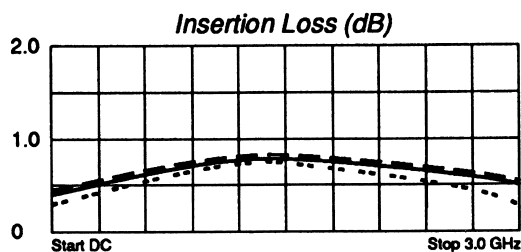
Pin Layout



Truth Table

Control Input		Switch Position
A	B	RF1 to RF2
High	Low	ON
Low	High	OFF

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

Amplifonix

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Rev. A 11/10/93

SPST RF SWITCH

MODEL TWD2215

Package: 14 Pin DIP (DP3)

Also Available In: Connectorized Housings

Features

- 5 - 3000 MHz
- RF2 Terminated in 'OFF' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

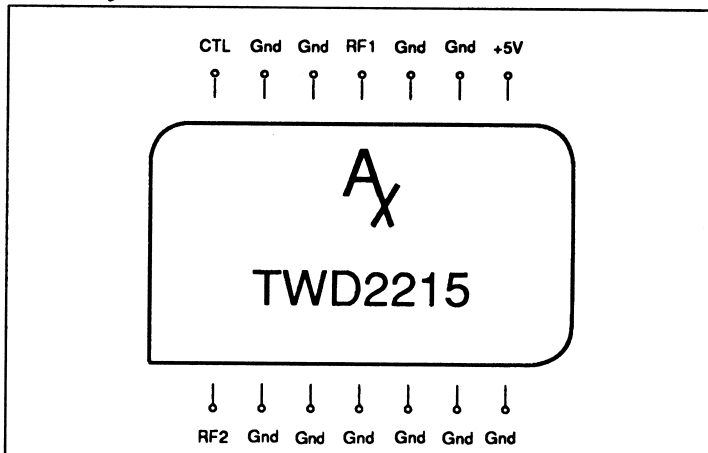
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +85 °C
Frequency	5 - 3000 MHz	5 - 3000 MHz
Insertion Loss (dB)		
5 - 1000 MHz	0.8	1.2 Max.
5 - 2000 MHz	1.2	1.5 Max.
5 - 3000 MHz	1.8	2.2 Max.
Isolation (dB)		
5 - 1000 MHz	50	46 Min.
5 - 2000 MHz	36	34 Min.
5 - 3000 MHz	31	29 Min.
VSWR "ON"/"OFF"		
5 - 1000 MHz	1.25:1	1.4:1 Max.
5 - 2000 MHz	1.5:1	1.6:1 Max.
5 - 3000 MHz	1.5:1	1.7:1 Max.
1 dB Compression (dBm)		
50 MHz	+18.5	+18.0 Min.
500 - 3000 MHz	+24	+22.0 Min.
Switching Speed (nsec) (50% TTL to 90% RF)	15	30 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	0.025	1.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

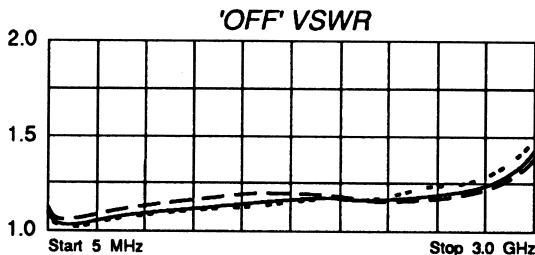
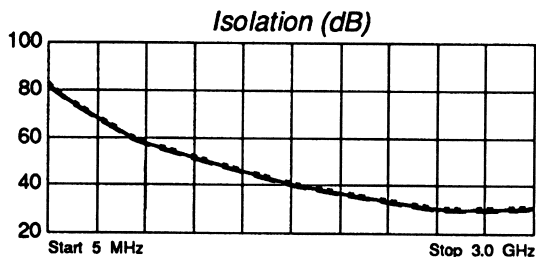
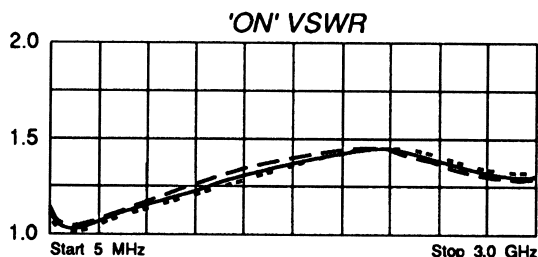
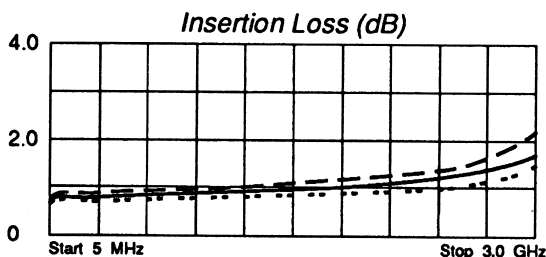
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF1 To RF2
0	"OFF"
1	"ON"

Typical Performance Data



Legend ——— + 25 °C — — — +85 °C · · · · · - 55 °C

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SPST RF SWITCH

MODEL TWD2216

Package: 14 Pin DIP (DP3)

Also Available In: Connectorized Housings

Features

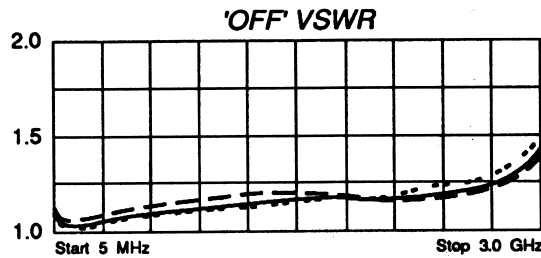
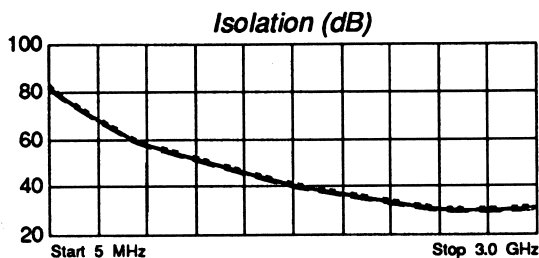
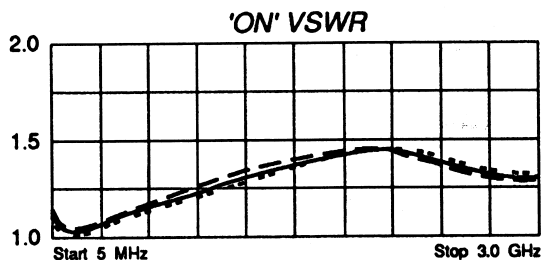
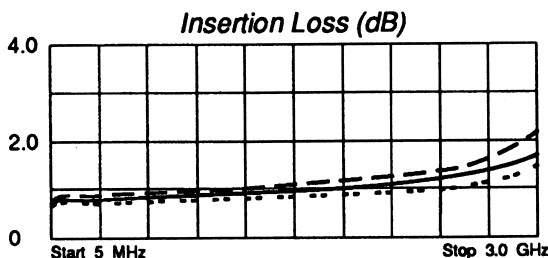
- 5 - 3000 MHz
- RF2 Terminated in 'OFF' State
- Integral CMOS Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +85 °C
Frequency	5 - 3000 MHz	5 - 3000 MHz
Insertion Loss (dB)		
5 - 1000 MHz	0.8	1.2 Max.
5 - 2000 MHz	1.2	1.5 Max.
5 - 3000 MHz	1.8	2.2 Max.
Isolation (dB)		
5 - 1000 MHz	50	46 Min.
5 - 2000 MHz	36	34 Min.
5 - 3000 MHz	31	29 Min.
VSWR "ON"/"OFF"		
5 - 1000 MHz	1.25:1	1.4:1 Max.
5 - 2000 MHz	1.5:1	1.6:1 Max.
5 - 3000 MHz	1.5:1	1.7:1 Max.
1 dB Compression (dBm)		
50 MHz	+18.5	+18.0 Min.
500 - 3000 MHz	+24	+22.0 Min.
Switching Speed (nsec) (50% TTL to 90% RF)	20	30 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	0.025	1.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

Typical Performance Data

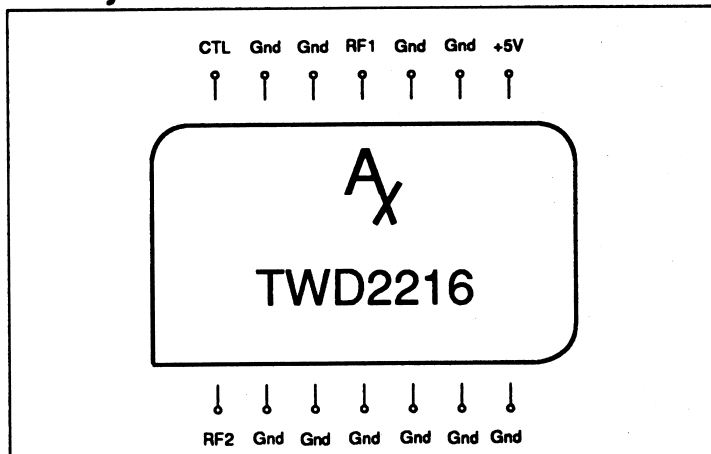


Legend ——— + 25 °C - - - - +85 °C - 55 °C

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +30 dBm

Pin Layout



Truth Table

Control Input	Switch Position
CMOS	RF1 To RF2
0	"OFF"
1	"ON"

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SPST RF SWITCH

MODEL TWP2219

Package: 8 Lead Flatpack (FP7)

Also Available In: Connectorized Housings

Features

- DC - 3.0 GHz
- Fast Switching Speed: 6 ns Typical
- Low Power Consumption: <250 μ W Typical
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

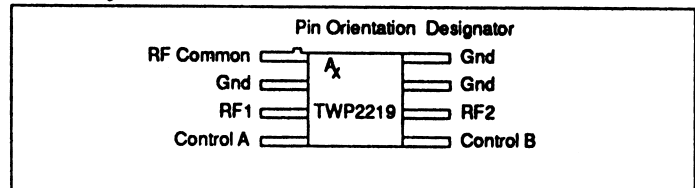
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage - 8.5 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 3.0 GHz	DC - 3.0 GHz
Insertion Loss (dB)	0.6	0.9 Max.
Isolation (dB)	≥ 27	25 Min.
VSWR	In Out	1.5:1 Max. 1.5:1 Max.
Control Input High	Vdc mA	- 5.0 to - 8.0 0.150
Control Input Low	Vdc mA	0 to - 0.2 0.010
Switching Speed (nsec)	6	10 Max.

Note: Care should always be taken to effectively ground the case of each unit

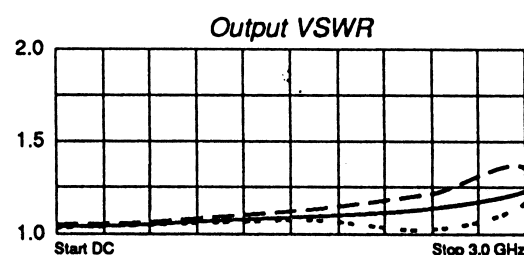
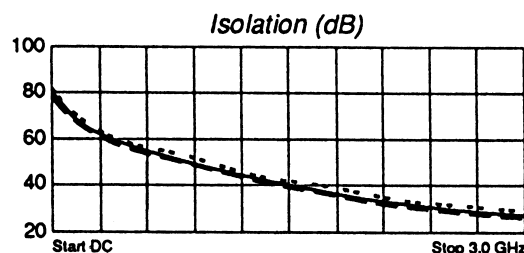
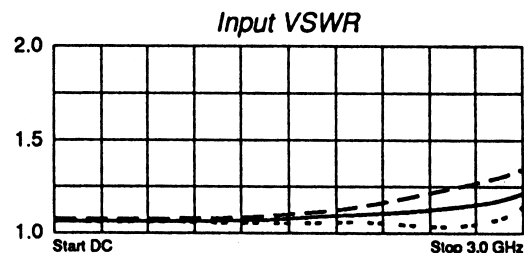
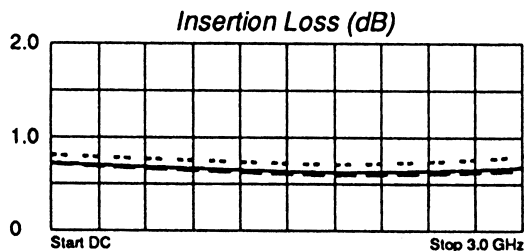
Pin Layout



Truth Table

Control Input		Switch Position	
		RF Common to:	
A	B	RF1	RF2
High	Low	ON	OFF
Low	High	OFF	ON

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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Rev. A 11/10/98

SPDT RF SWITCH

MODEL TWK2224

Package: 8 Pin TO-5 (T2)

Also Available In: Connectorized Housings

Features

- DC - 2.0 GHz
- Fast Switching Speed: 20 ns Typical
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Maximum Ratings

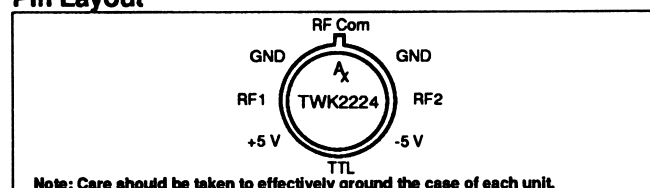
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage ± 7.0 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	DC - 2.0 GHz	DC - 2.0 GHz
Insertion Loss (dB)		
DC - 2 GHz	0.6	0.8 Max.
DC - 1 GHz	0.5	0.7 Max.
DC - 0.5 GHz	0.5	0.7 Max.
Isolation (dB)		
DC - 2 GHz	≥32	30 Min.
DC - 1 GHz	≥38	35 Min.
DC - 0.5 GHz	≥45	40 Min.
VSWR 'ON'		
DC - 2 GHz	<1.25:1	1.5:1 Max.
DC - 1 GHz	<1.12:1	1.15:1 Max.
DC - 0.5 GHz	<1.10:1	1.15:1 Max.
DC Bias	Vdc mA	±5 V 1.0 Max.
Switching Speed (nsec)*	20	25 Max.
Transients (mV)	5	10 Max.
T Rise/Fall (nsec)	15	—
1 dB Compression (dBm)		
0.05 GHz	21	—
0.5 - 2 GHz	27	—
Intercept Points (dBm)	IP ₁ +57 +68	IP ₂ +40 +46

* t_{ON}, t_{OFF} (50% CTL to 90%/10% RF)

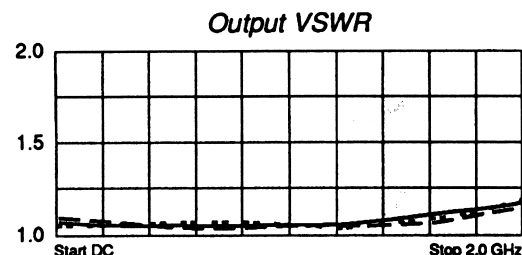
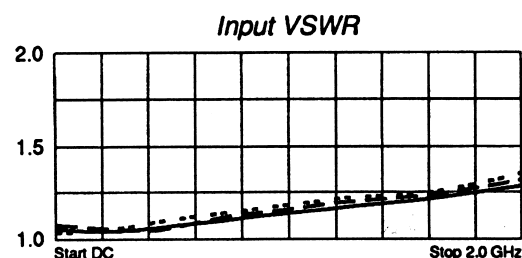
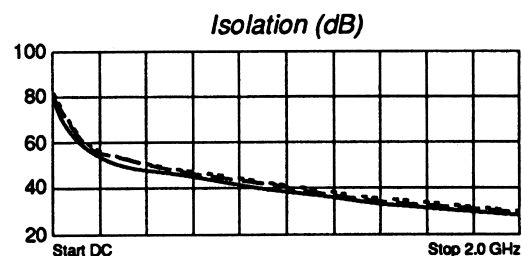
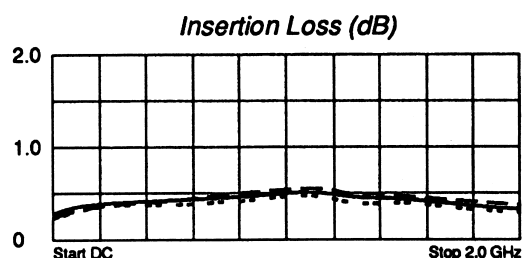
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To:
1	RF1
0	RF2

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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RF SWITCH MODEL TWP2225

Available in: FP-12, 6 Lead, 0.375" sq. Flatpack
and 6 Lead, 0.375" sq. Surface Mount Package

Features

- DC - 2.0 GHz
- Fast Switching Speed: 20 ns Typical
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Maximum Ratings

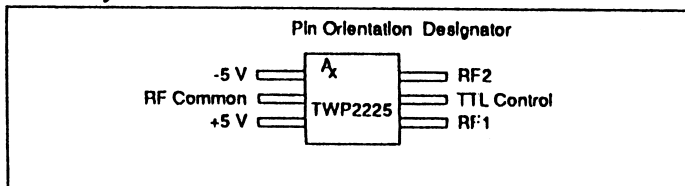
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage ± 7.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC		TYPICAL $T_a = 25\text{ }^{\circ}\text{C}$	MIN/MAX $T_a = -55\text{ }^{\circ}\text{C to } +85\text{ }^{\circ}\text{C}$
Frequency		DC - 2.0 GHz	DC - 2.0 GHz
Insertion Loss (dB)		0.6	0.8 Max.
Isolation (dB)		≥ 32	29 Min.
VSWR 'ON'		<1.25:1	1.5:1 Max.
DC Bias	Vdc mA	± 5 V 0.5	± 6 V 1.2 Max.
Switching Speed (nsec)		20	25 Max.

Note: Care should always be taken to effectively ground the case of each unit

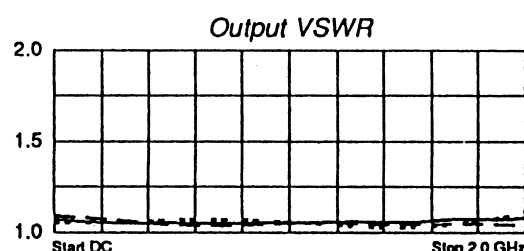
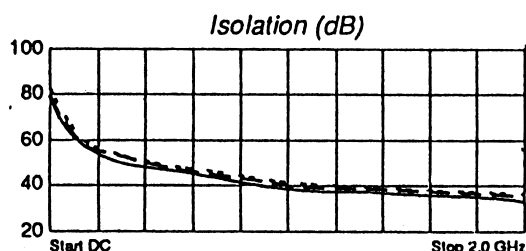
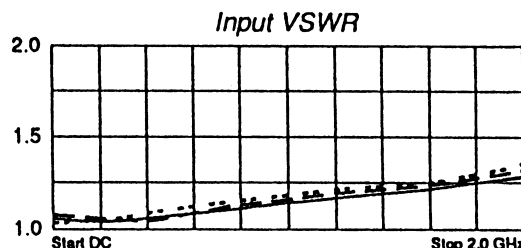
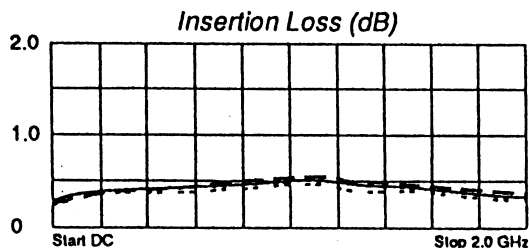
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To:
1	RF1
0	RF2

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SP3T RF SWITCH

MODEL TWD2241

Available in: DP-10, 16 Pin DIP Package
and Connectorized Housings

Features

- 5- 2000 MHz
- Fast Switching Speed: 15 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening Available

Maximum Ratings

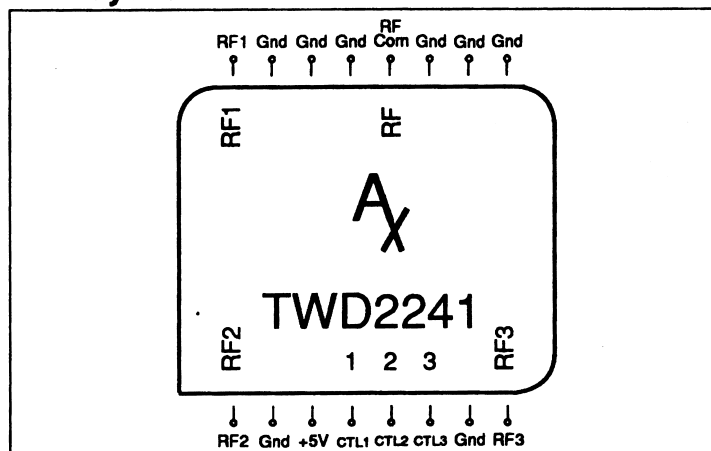
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (dB)	1.2	1.8 Max.
Isolation (dB)	50	35 Min.
VSWR	1.5:1	2.0:1 Max.
DC Bias	Vdc mA	+5 V 1.0 Max.
Switching Speed (nsec)	15	20 Max.
Transients (mV)	80	—
1 dB Compression (dBm)		
0.05 GHz	21	—
0.5 - 2 GHz	27	—
Intercept Points (dBm)	IP ₁ IP ₂	—
0.05 GHz	+62 +40	—
0.5 - 2 GHz	+68 +46	—

Note: Care should always be taken to effectively ground the case of each unit

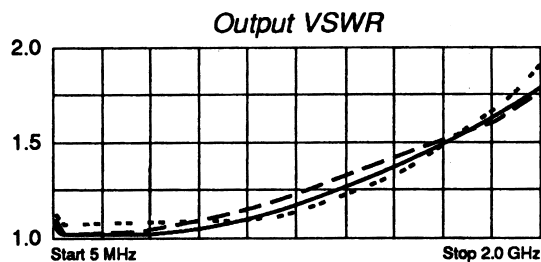
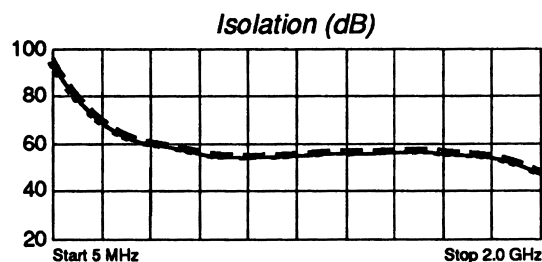
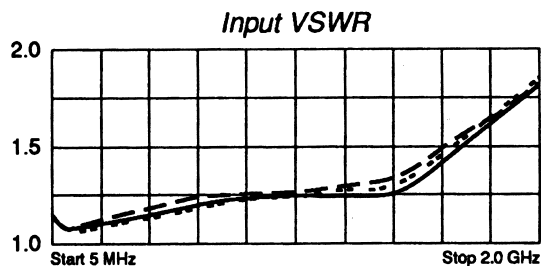
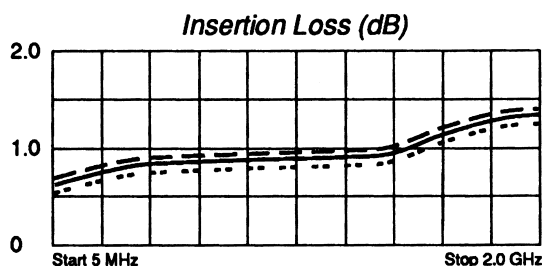
Pin Layout



Truth Table

Control Input	Switch Condition
TTL	RF Common To RF Throw
1	Low Loss
0	Isolated

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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Rev. A 11/14/91

SP3T RF SWITCH MODEL TWP2248

Package: FP14 - 16 Lead Flatpack
Also Available in: Connectorized Housings

Features

- 5- 2000 MHz; Integral TTL Driver
- Fast Switching Speed: 15 ns Typical (GaAs)
- RF1 - RF3 Reflective in "OFF" State
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

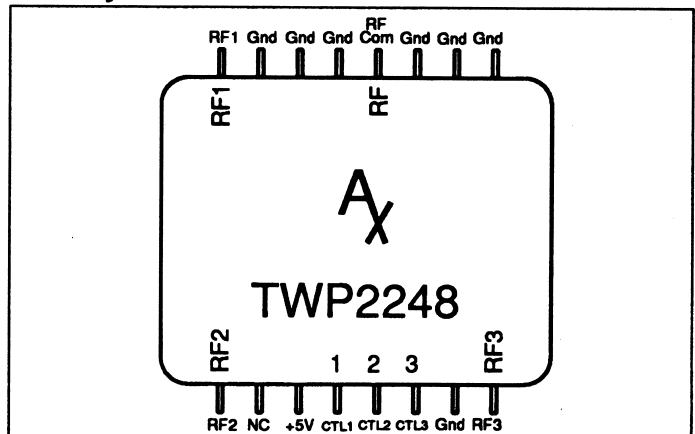
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (dB)	1.2	2.0 Max.
Isolation (dB)	45	34 Min.
VSWR 'ON'	1.5:1	2.0:1 Max.
DC Bias Vdc Bias mA	+5 V 0.5	+5 V Max. 1.0 Max.
Switching Speed (nsec)	15	40 Max.
Transients (mV)	80	—
1 dB Compression (dBm) 0.05 GHz 0.5 - 2 GHz	21 27	— —
Intercept Points (dBm) 0.05 GHz 0.5 - 2 GHz	IP ₁ +62 IP ₃ +40 +68 +46	— —

Note: Care should always be taken to effectively ground the case of each unit

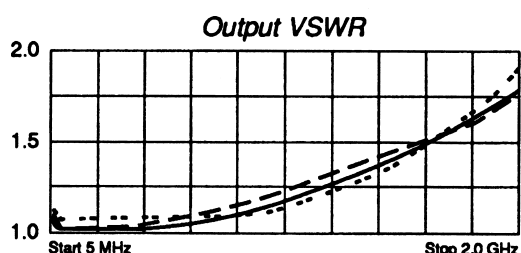
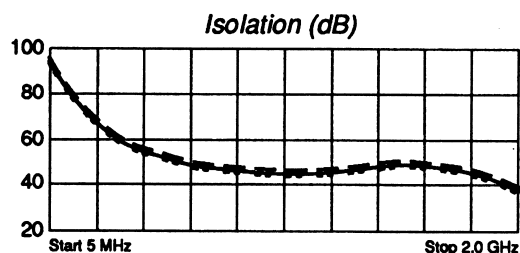
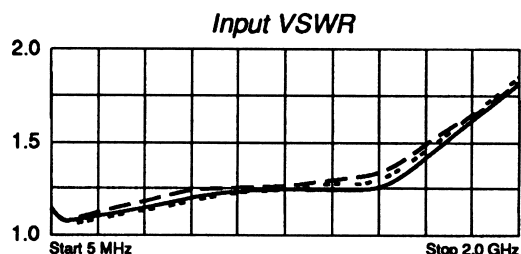
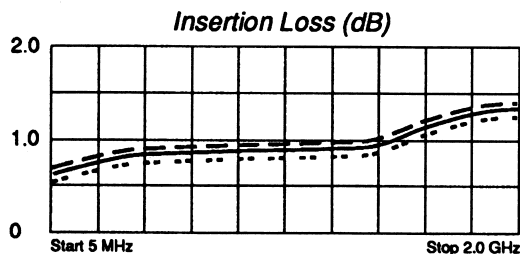
Pin Layout



Truth Table

Control Input	Switch Condition
TTL	RF Common To RF Throw
1	Low Loss ("ON")
0	Isolated ("OFF")

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SP4T RF SWITCH

MODEL TWD2254

Available in: DP-10, 16 Pin DIP Package
and Connectorized Housings

Features

- 5- 2000 MHz
- Fast Switching Speed: 15 ns Typical (GaAs)
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Maximum Ratings

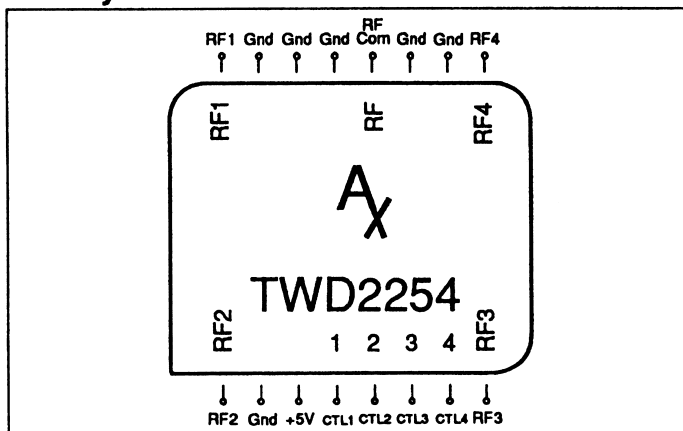
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (dB)	1.2	1.9 Max.
Isolation (dB)	50	35 Min.
VSWR	1.5:1	2.3:1 Max.
DC Bias	Vdc mA	+5 V 1.0 Max.
Switching Speed (nsec)	15	20 Max.
Transients (mV)	80	—
1 dB Compression (dBm)		
0.05 GHz	21	—
0.5 - 2 GHz	27	—
Intercept Points (dBm)	IP ₂ IP ₃	
0.05 GHz	+62 +40	—
0.5 - 2 GHz	+68 +46	—

Note: Care should always be taken to effectively ground the case of each unit

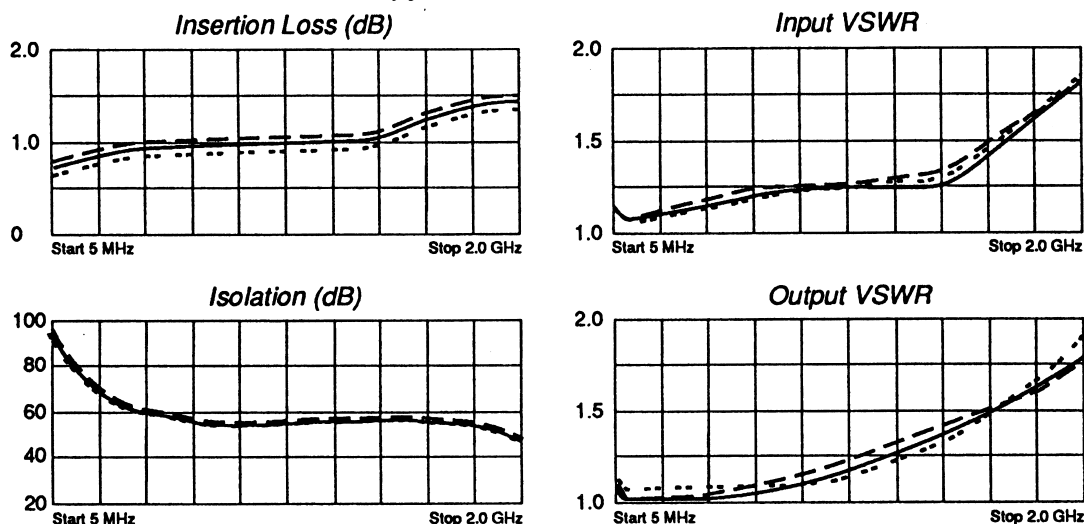
Pin Layout



Truth Table

Control Input	Switch Condition
TTL	RF Common To RF Throw
1	Low Loss
0	Isolated

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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Rev. A 11/14/91

Amplifonix

SP4T RF SWITCH MODEL TWP2261

Package: FP14 - 16 Lead Flatpack
Also Available in: Connectorized Housings

Features

- 5- 2000 MHz
- RF1 - RF4 Terminated in "OFF" State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Specifications

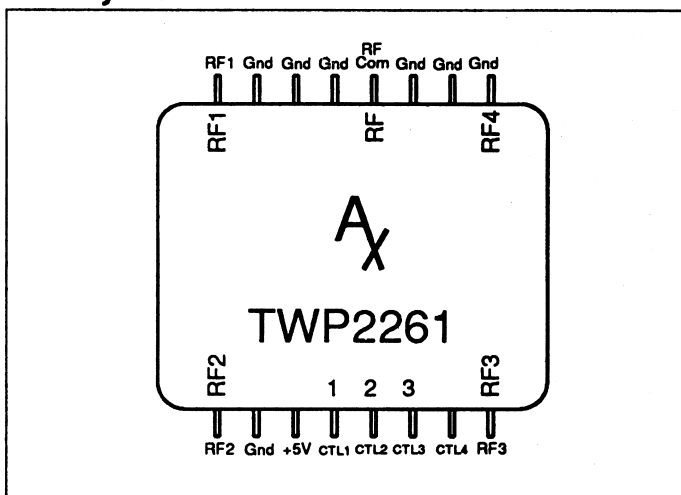
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (dB)	1.2	1.9 Max.
Isolation (dB)	45	35 Min.
VSWR 'ON'	1.5:1	2.0:1 Max.
DC Bias Vdc Bias mA	+5 V 0.5	+5 V Max. 1.0 Max.
Switching Speed Ton/Toff (nsec)	15	20 Max.
Transition Time Rise/Fall Time (nsec)	3	7 Max.
Transients (mV)	80	—
1 dB Compression (dBm) 0.05 GHz 0.5 - 2 GHz	21 27	—
Intercept Points (dBm) 0.05 GHz 0.5 - 2 GHz	IP ₁ +62 IP ₂ +40 +68 +46	—

Note: Care should always be taken to effectively ground the case of each unit

Maximum Ratings

Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7.0 Volts
Continuous RF Input Power +30 dBm

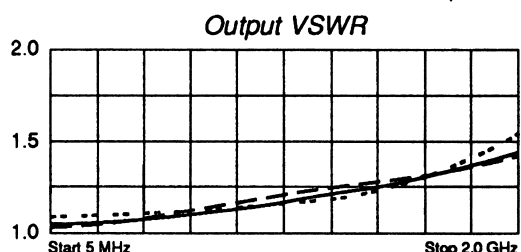
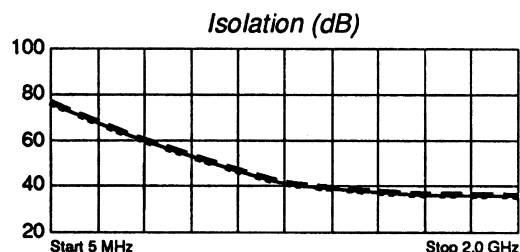
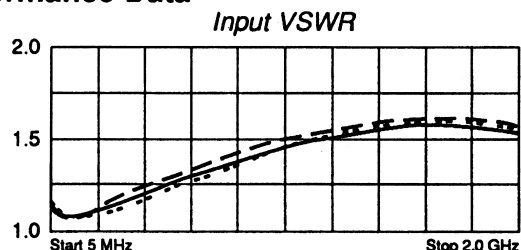
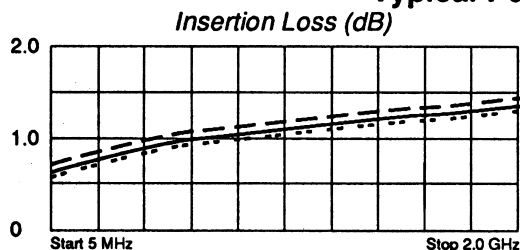
Pin Layout



Truth Table

Control Input	Switch Condition
TTL	RF Common To RF Throw
1	Low Loss ("ON")
0	Isolated ("OFF")

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

SP4T RF SWITCH MODEL TWP2264

Package: FP14 - 16 Lead Flatpack
Also Available In: Connectorized Housings

Features

- 5- 2000 MHz
- RF1 - RF4 Terminated in "OFF" State
- Integral CMOS Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

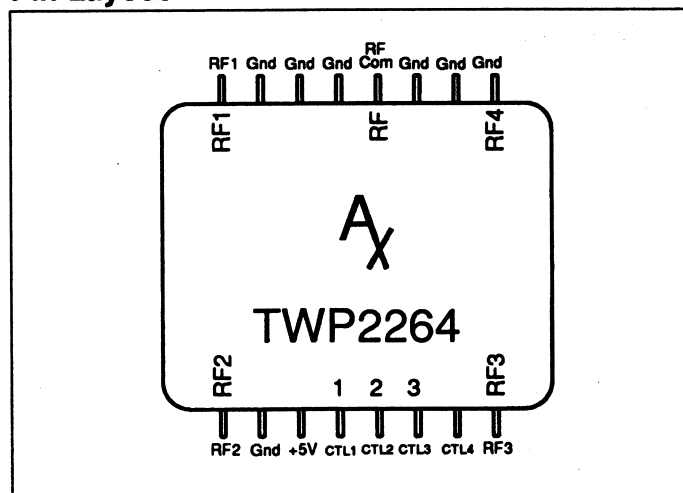
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage + 7.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	5 - 2000 MHz	5 - 2000 MHz
Insertion Loss (dB)	1.2	1.9 Max.
Isolation (dB)	45	35 Min.
VSWR 'ON'	1.5:1	2.0:1 Max.
DC Vdc	+5 V	+5 V Max.
Bias mA	0.5	1.0 Max.
Switching Speed Ton/Toff (nsec)	40	50 Max.
Transition Time Rise/Fall Time (nsec)	20	30 Max.
Transients (mV)	80	—
1 dB Compression (dBm) 0.05 GHz 0.5 - 2 GHz	21 27	—
Intercept Points (dBm) 0.05 GHz 0.5 - 2 GHz	IP ₁ +62 +68	IP ₂ +40 +46

Note: Care should always be taken to effectively ground the case of each unit

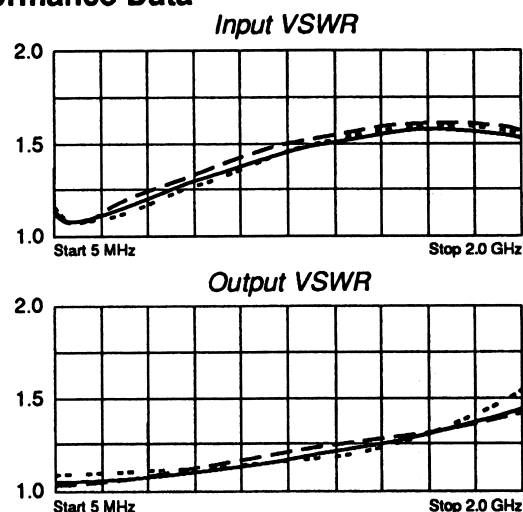
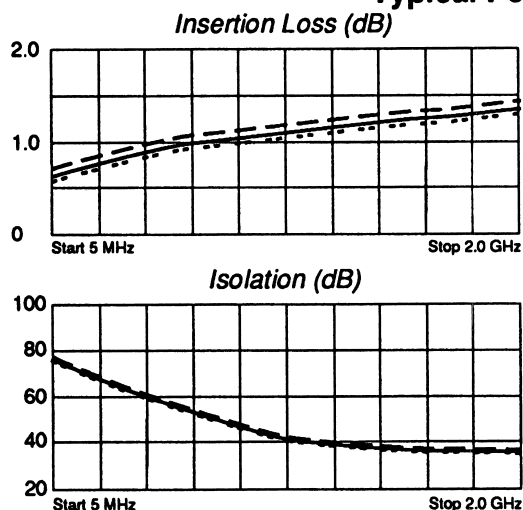
Pin Layout



Truth Table

Control Input	Switch Condition
TTL	RF Common To RF Throw
1	Low Loss ("ON")
0	Isolated ("OFF")

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C · · · · - 55 °C

Amplifonix

2707 Black Lake Place, Philadelphia, PA 19154

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SPST RF SWITCH

MODEL TWM5000

Package: 5 Pin TO-8 (T5)

Also Available In: Connectorized Housings

Features

- 10 - 1500 MHz
- RF1, RF2 Terminated in 'Off' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

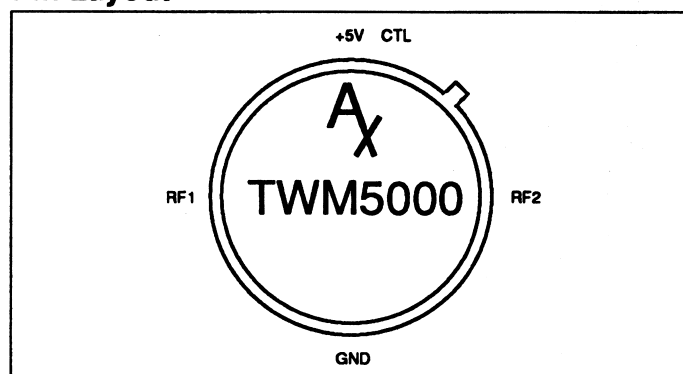
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +6.0 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC		TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency		10 - 1500 MHz	10 - 1500 MHz
Insertion Loss (dB)		1.2	1.7 Max.
Isolation (dB)		48	39 Min.
VSWR		1.3:1	1.7:1 Max.
DC Bias	Vdc mA	+5 2	+5 5 Max. Max.
Switching Speed (µsec)		0.15	0.50 Max.
Transients (mV)		200	—
1 dB Compression (dBm)		+23	—
Intercept Points (dBm)		IP ₂ +65 IP ₃ +40	—

Note: Care should always be taken to effectively ground the case of each unit

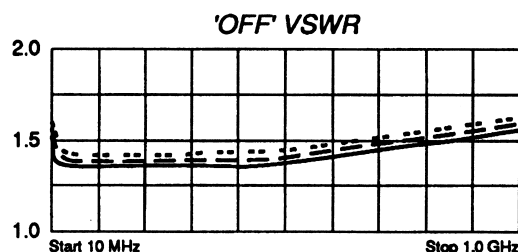
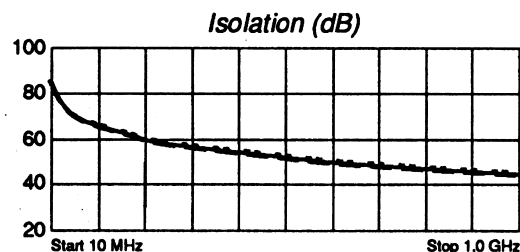
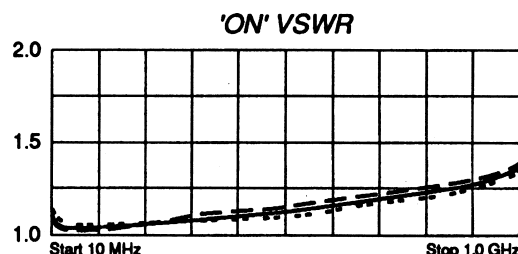
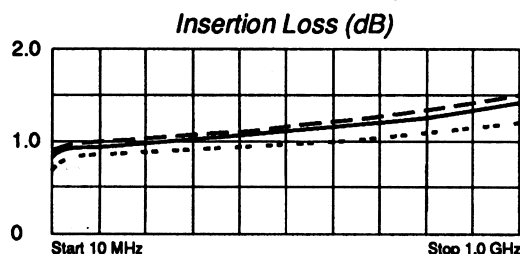
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF1 to RF2
0	'OFF'
1	'ON'

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SPDT RF SWITCH MODEL TWD5001

Package: DP3 - 14 lead DIP Package

Also Available in: Connectorized Housings

Features

- 10- 1000 MHz
- RF1, RF2 Terminated in 'Off' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

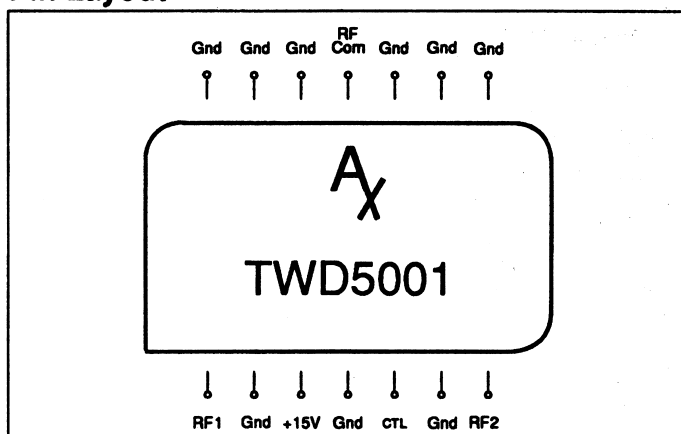
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage +17.0 Volts
 Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	10 - 1000 MHz	10 - 1000 MHz
Insertion Loss (dB)	1.0	2.0 Max.
Isolation (dB)	45	25 Min.
VSWR	1.2:1	1.5:1 Max.
DC Bias Vdc Bias mA	+15 V 15	+15 V Max. 23 Max.
Switching Speed (µsec)	3	4 Max.
Transients (mV)	750	—
1 dB Compression (dBm)	+23	—
Intercept Points (dBm)	IP ₂ +65 IP ₃ +40	—

Note: Care should always be taken to effectively ground the case of each unit

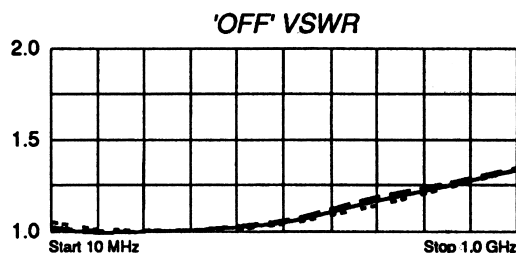
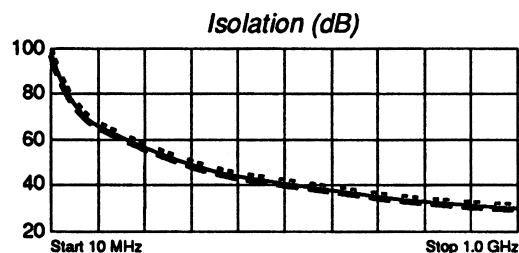
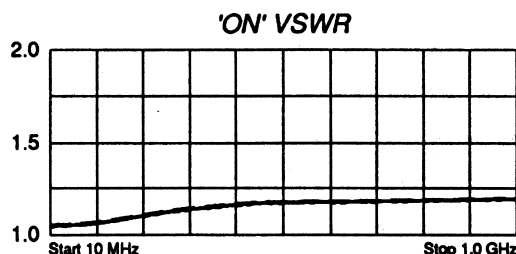
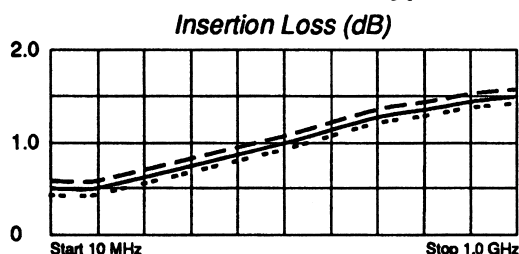
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To
1	RF1
0	RF2

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SPDT RF SWITCH MODEL TWD5002

Package Style: 14 Lead DIP Package (DP11)

Also Available In: Connectorized Housings

Features

- 30- 1000 MHz
- RF1, RF2 Terminated in 'Off' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Environmental Screening available

Maximum Ratings

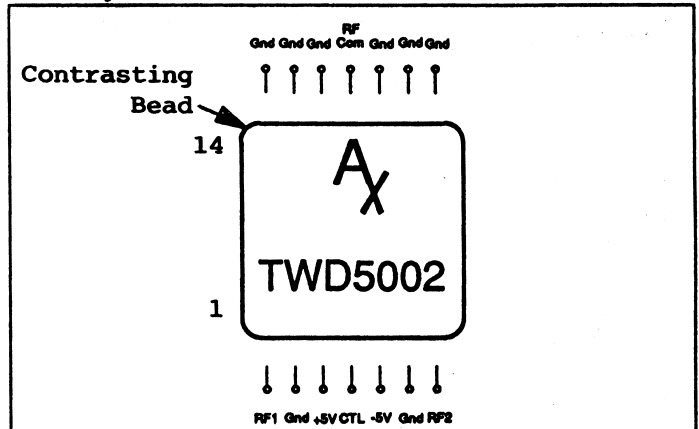
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage +6.0; -6.0 Volts
Continuous RF Input Power +30 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	30 - 1000 MHz	30 - 1000 MHz
Insertion Loss (dB)	0.8	1.5 Max.
Isolation (dB)	75	55 Min.
VSWR	1.2:1	1.5:1 Max.
DC Bias	+Vdc/mA -Vdc/mA	+5/18 Max. - 5/12 Max.
Switching Speed (µsec)	0.75	2.0 Max.
Transients (mV)	750	—
1 dB Compression (dBm)	+23	—
Intercept Points (dBm)	IP ₂ +65 IP ₃ +40	—

Note: Care should always be taken to effectively ground the case of each unit

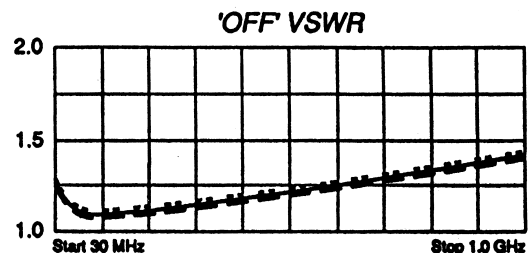
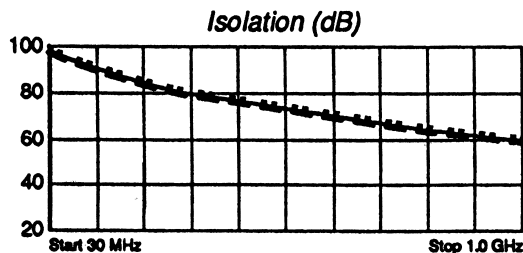
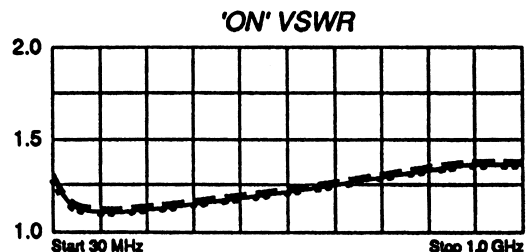
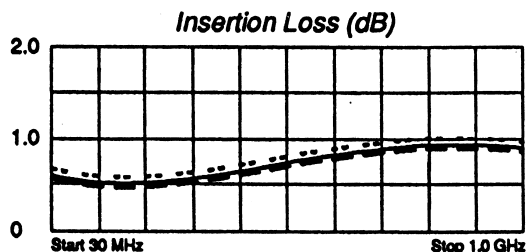
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To
0	RF1
1	RF2

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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REV A 7/22/02

SP8T RF SWITCH

MODEL TWD5005

Available in: DP-5, 24 Pin DIP Package
and Connectorized Housings

Features

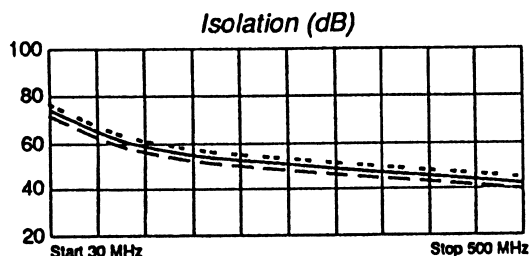
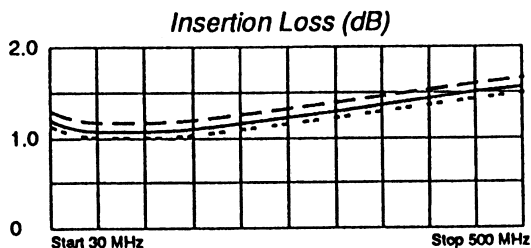
- 30- 500 MHz
- RF1-RF8 Terminated in 'Off' State
- Integral TTL /BCD Driver
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	30 - 500 MHz	30 - 500 MHz
Insertion Loss (dB)	1.2	1.8 Max.
Isolation (dB)	55	40 Min.
VSWR	1.5:1	2.0:1 Max.
DC +Vdc/mA Bias -Vdc/mA	+5/20 -5/3	+5/25 Max. -5/5 Max.
Switching Speed (nsec)	400	500 Max.
Transients (mV)	300	—
1 dB Compression (dBm)	+23	—
Intercept Points (dBm)	IP ₁ +65 IP ₂ +40	—

Note: Care should always be taken to effectively ground the case of each unit

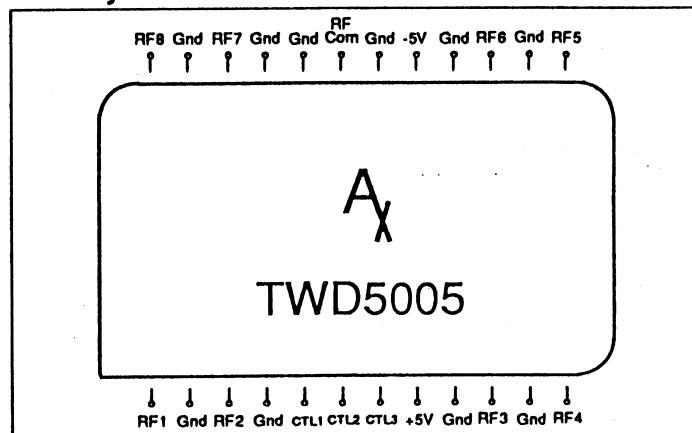
Typical Performance Data



Maximum Ratings

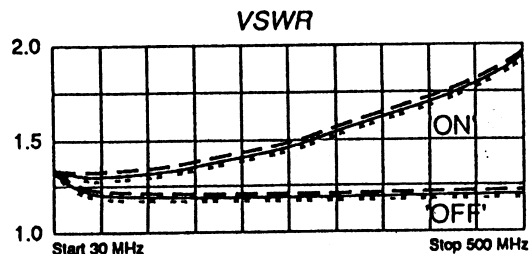
Ambient Operating Temperature - 55 °C to + 100 °C
Storage Temperature - 65 °C to + 125 °C
Case Temperature + 125 °C
DC Voltage ± 6.0 Volts
Continuous RF Input Power +30 dBm

Pin Layout



Truth Table

TTL Control Input			Switch Position
C3	C2	C1	RF Common Connected To
0	0	0	RF1
0	0	1	RF2
0	1	0	RF3
0	1	1	RF4
1	0	0	RF5
1	0	1	RF6
1	1	0	RF7
1	1	1	RF8



Legend ——— + 25 °C — — — + 85 °C · · · · · - 55 °C

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SPDT RF SWITCH

MODEL TWD5015

Available in: DP-3, 14 Pin DIP Package
and Connectorized Housings

Features

- 20- 1000 MHz
- RF1, RF2 Terminated in 'Off' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 85 °C
- Screening to the tables of MIL-STD-883 available

Specifications

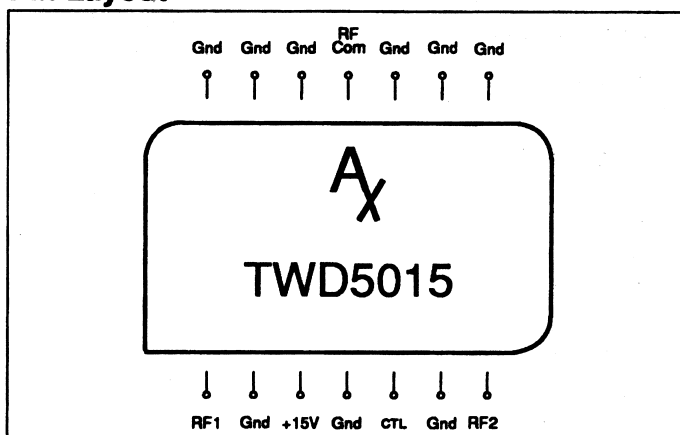
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to + 85 °C
Frequency	20 - 1000 MHz	20 - 1000 MHz
Insertion Loss (dB)	1.2	2.0 Max.
Isolation (dB)	45	25 Min.
VSWR	1.2:1	1.5:1 Max.
DC Bias Vdc Bias mA	+5 V 15	+5 V Max. 23 Max.
Switching Speed (µsec)	0.7	1.0 Max.
Transients (mV)	750	—
1 dB Compression (dBm)	+23	—
Intercept Points (dBm)	IP ₂ +65 IP ₃ +40	—

Note: Care should always be taken to effectively ground the case of each unit

Maximum Ratings

Ambient Operating Temperature	- 55 °C to + 100 °C
Storage Temperature	- 65 °C to + 125 °C
Case Temperature	+ 125 °C
DC Voltage	+6.0 Volts
Continuous RF Input Power	+30 dBm

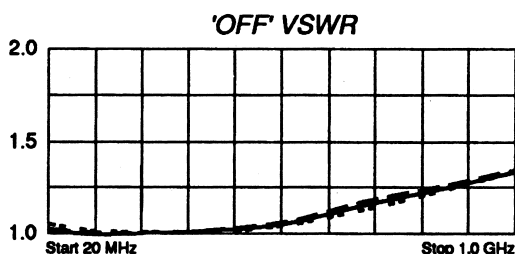
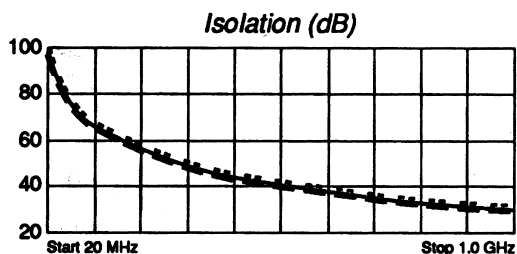
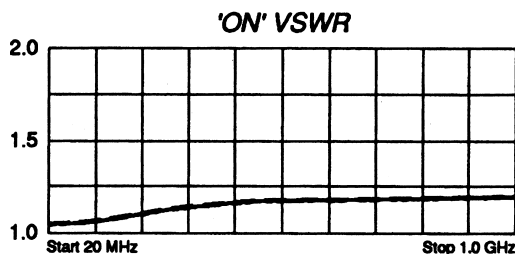
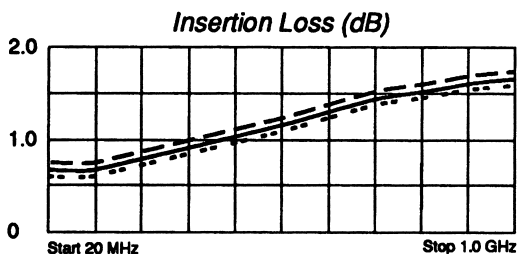
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To
1	RF1
0	RF2

Typical Performance Data



Legend ——— + 25 °C - - - - + 85 °C - 55 °C

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SP3T RF SWITCH

MODEL TWH5016

Package: 12 Pin TO-8B (T8)

Also Available In: Connectorized Housings

Features

- 10 - 3000 MHz
- RF1-RF3 Reflective in 'OFF' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 100 °C
- Environmental Screening available

Maximum Ratings

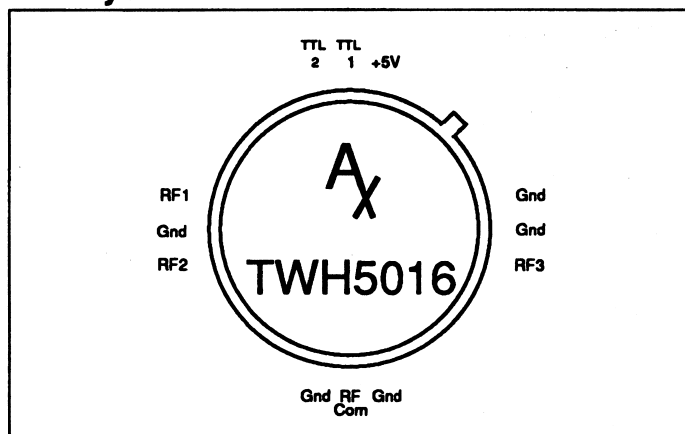
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +32 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +100 °C
Frequency	10 - 3000 MHz	10 - 3000 MHz
Insertion Loss (dB)		
10 - 100 MHz	1.0	1.5 Max.
100 - 1500 MHz	1.2	1.6 Max.
1500 - 3000 MHz	1.4	2.4 Max.
Isolation (dB)		
10 - 100 MHz	70	60 Min.
100 - 1500 MHz	45	35 Min.
1500 - 3000 MHz	35	30 Min.
1 dB Compression (dBm)		
10 - 100 MHz	18	8 Min.
100 - 1500 MHz	27	20 Min.
1500 - 3000 MHz	30	29 Min.
VSWR 'ON'	1.3:1	1.6:1 Max.
Switching Speed (µsec) (50% TTL to 90% RF)	2.0	3.0 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	2.4	4.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

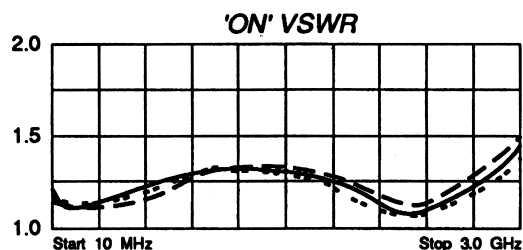
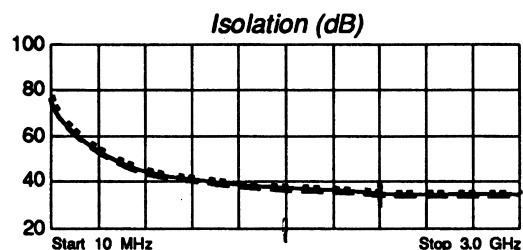
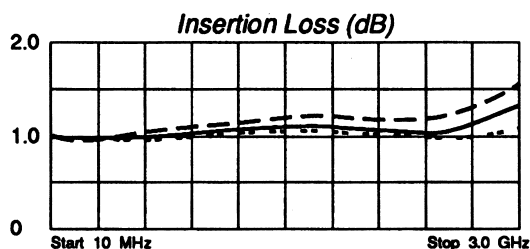
Pin Layout



Truth Table

TTL Control Inputs		Switch Position
TTL1	TTL2	RF Common Connected To
0	0	RF1
1	0	RF2
0	1	RF3

Typical Performance Data



Legend ——— + 25 °C — — — +100 °C · · · · · - 55 °C

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Rev. A 08/08/92

SP5T RF SWITCH

MODEL TWH5017

Package: 12 Pin TO-8B (T8)

Also Available In: Connectorized Housings

Features

- 10 - 3000 MHz
- RF1-RF5 Reflective in 'OFF' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 100 °C
- Environmental Screening available

Maximum Ratings

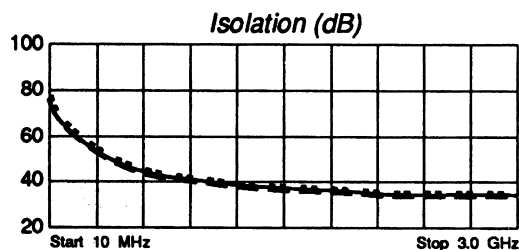
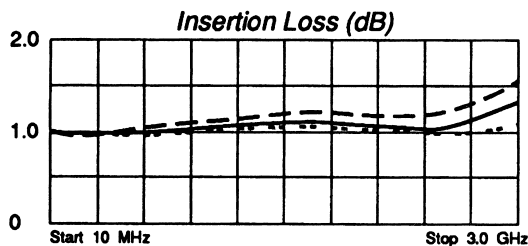
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +32 dBm

Specifications

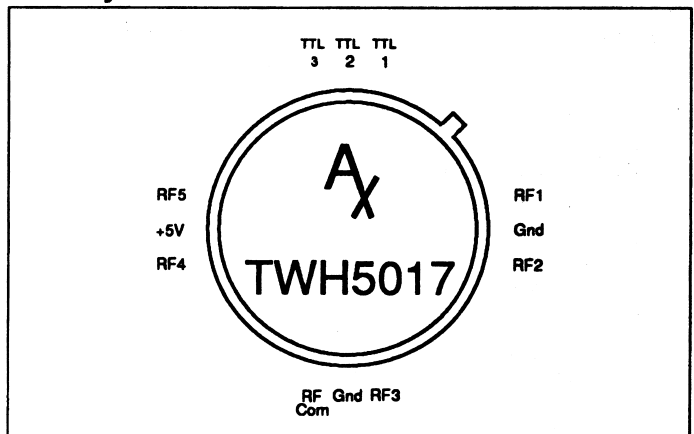
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +100 °C
Frequency	10 - 3000 MHz	10 - 3000 MHz
Insertion Loss (dB)		
10 - 100 MHz	1.0	1.5 Max.
100 - 1500 MHz	1.2	1.6 Max.
1500 - 3000 MHz	1.4	2.4 Max.
Isolation (dB) *		
10 - 100 MHz	70	60 Min.
100 - 1500 MHz	45	35 Min.
1500 - 3000 MHz	35	30 Min.
1 dB Compression (dBm)		
10 - 100 MHz	18	8 Min.
100 - 1500 MHz	27	20 Min.
1500 - 3000 MHz	30	29 Min.
VSWR 'ON'	1.3:1	1.6:1 Max.
Switching Speed (µsec) (50% TTL to 90% RF)	2.0	3.0 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	2.4	4.0 Max.

* Isolation at RF4 degraded by 15 dB.

Typical Performance Data

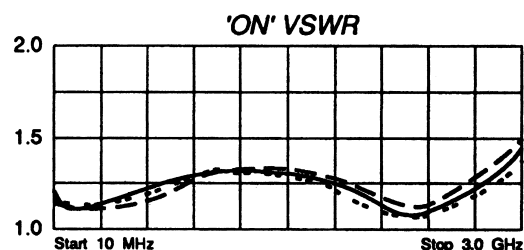


Pin Layout



Truth Table

TTL Control Inputs			Switch Position
TTL1	TTL2	TTL3	RF Common Connected To
0	0	0	RF1
1	0	0	RF2
0	1	0	RF3
1	1	0	RF4
0	0	1	RF5



Legend ——— + 25 °C — — — +100 °C - 55 °C

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Rev. B 7/26/0

SPDT RF SWITCH MODEL TWH7230

Package: 12 Pin TO-8B (T8)

Also Available In: Connectorized Housings

Features

- 10 - 3000 MHz
- RF1, RF2 Reflective in 'OFF' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 100 °C
- Environmental Screening available

Maximum Ratings

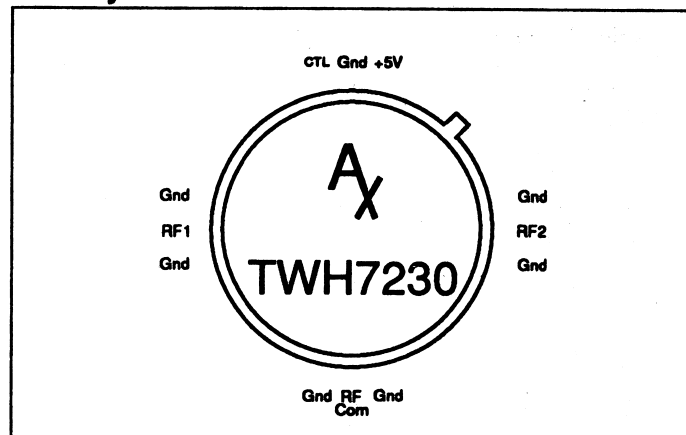
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +32 dBm

Specifications

CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +100 °C
Frequency	10 - 3000 MHz	10 - 3000 MHz
Insertion Loss (dB)		
10 - 100 MHz	1.0	1.5 Max.
100 - 1500 MHz	1.2	1.6 Max.
1500 - 3000 MHz	1.4	2.4 Max.
Isolation (dB)		
10 - 100 MHz	70	60 Min.
100 - 1500 MHz	45	35 Min.
1500 - 3000 MHz	35	30 Min.
1 dB Compression (dBm)		
10 - 100 MHz	18	8 Min.
100 - 1500 MHz	27	20 Min.
1500 - 3000 MHz	30	29 Min.
VSWR 'ON'	1.3:1	1.6:1 Max.
Switching Speed (µsec) (50% TTL to 80% RF)	2.0	3.0 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	2.4	4.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

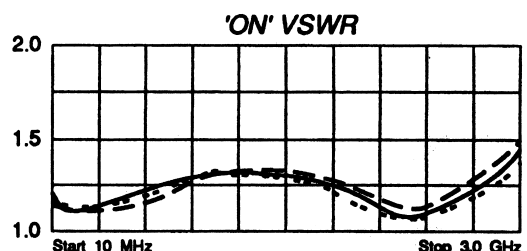
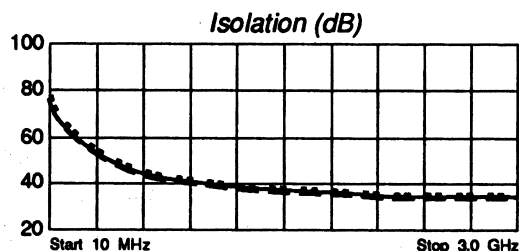
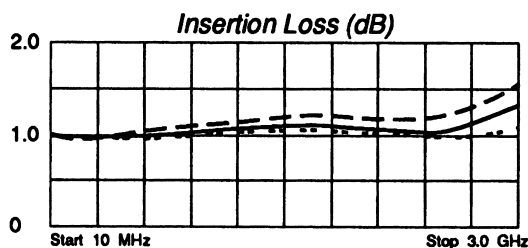
Pin Layout



Truth Table

Control Input	Switch Position
TTL	RF Common Connected To
0	RF1
1	RF2

Typical Performance Data



Legend ——— + 25 °C — — — + 100 °C · · · · - 55 °C

Amplifonix

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Rev. A 08/08/92

SP4T RF SWITCH MODEL TWH7425

Package: 12 Pin TO-8B (T8)

Also Available In: Connectorized Housings

Features

- 10 - 3000 MHz
- RF1-RF4 Reflective in 'OFF' State
- Integral TTL Driver
- Operating Temp. - 55 °C to + 100 °C
- Environmental Screening available

Maximum Ratings

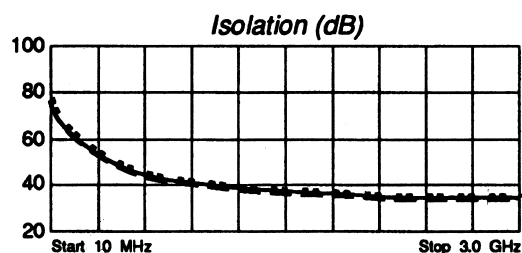
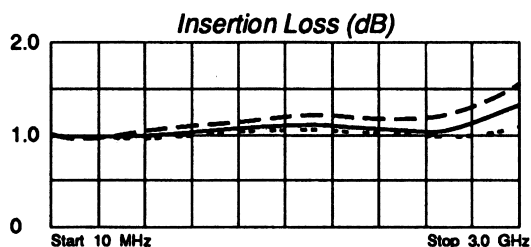
Ambient Operating Temperature - 55 °C to + 100 °C
 Storage Temperature - 65 °C to + 125 °C
 Case Temperature + 125 °C
 DC Voltage + 6.0 Volts
 Continuous RF Input Power +32 dBm

Specifications

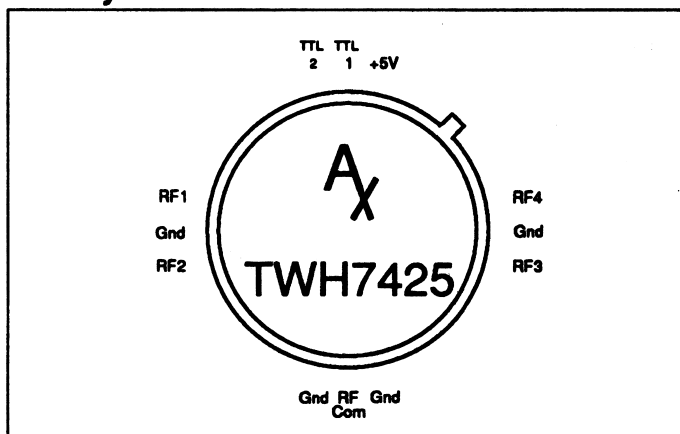
CHARACTERISTIC	TYPICAL Ta = 25 °C	MIN/MAX Ta = - 55 °C to +100 °C
Frequency	10 - 3000 MHz	10 - 3000 MHz
Insertion Loss (dB)		
10 - 100 MHz	1.0	1.5 Max.
100 - 1500 MHz	1.2	1.6 Max.
1500 - 3000 MHz	1.4	2.4 Max.
Isolation (dB)		
10 - 100 MHz	70	60 Min.
100 - 1500 MHz	45	35 Min.
1500 - 3000 MHz	35	30 Min.
1 dB Compression (dBm)		
10 - 100 MHz	18	8 Min.
100 - 1500 MHz	27	20 Min.
1500 - 3000 MHz	30	29 Min.
VSWR 'ON'	1.3:1	1.6:1 Max.
Switching Speed (μsec) (50% TTL to 90% RF)	2.0	3.0 Max.
DC Bias (mA) (4.5 to 5.5 VDC)	2.4	4.0 Max.

Note: Care should always be taken to effectively ground the case of each unit

Typical Performance Data

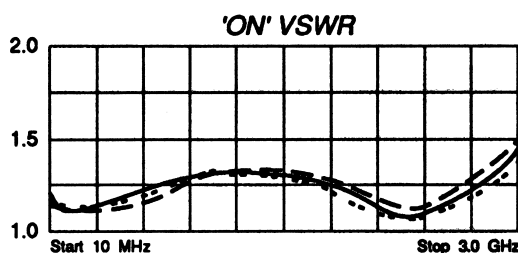


Pin Layout



Truth Table

TTL Control Inputs		Switch Position
TTL1	TTL2	RF Common Connected To
0	0	RF4
1	0	RF1
0	1	RF3
1	1	RF2



Legend ——— + 25 °C - - - - +100 °C - 55 °C

Amplifonix

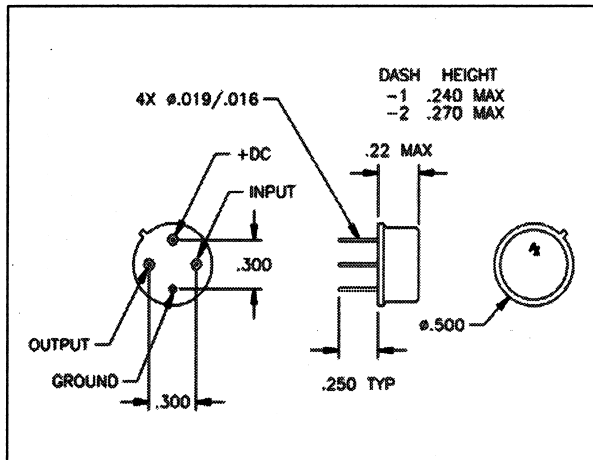
2707 Black Lake Place, Philadelphia, PA 19154

TEL 215-464-4000 • • • • FAX 215-464-4001

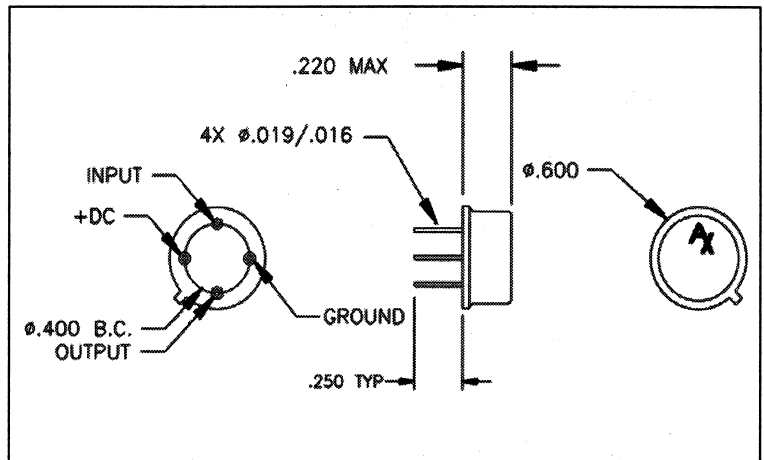
Rev. A 08/08/92

Amplifier Outline Drawings

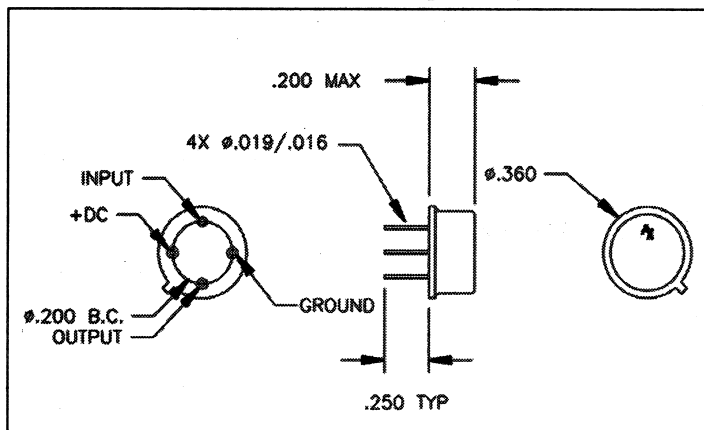
TO-8 Package (T4)



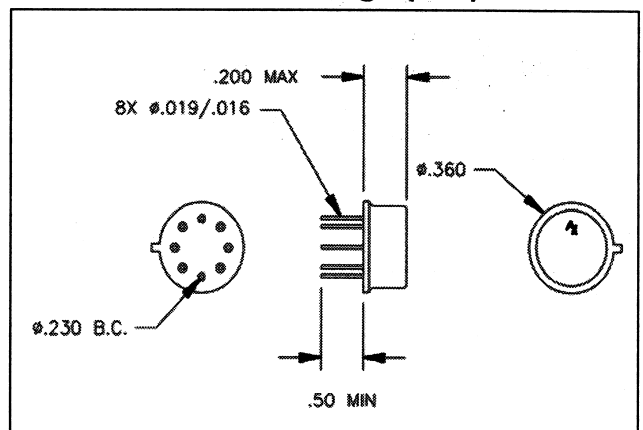
TO-8B Package (T8)



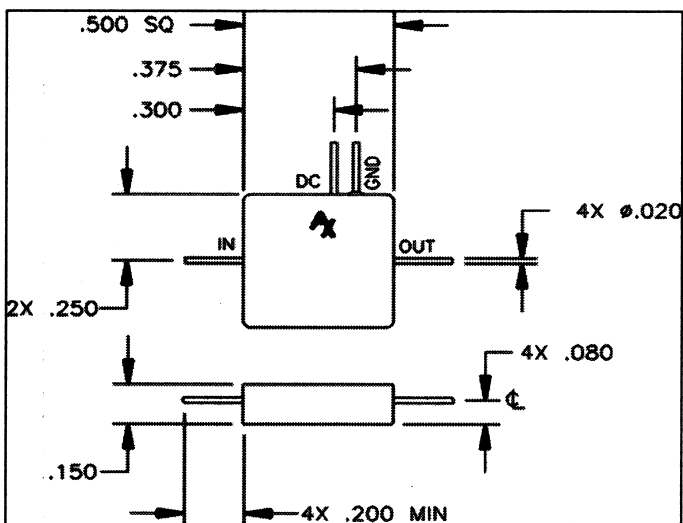
TO-12 Package (T7)



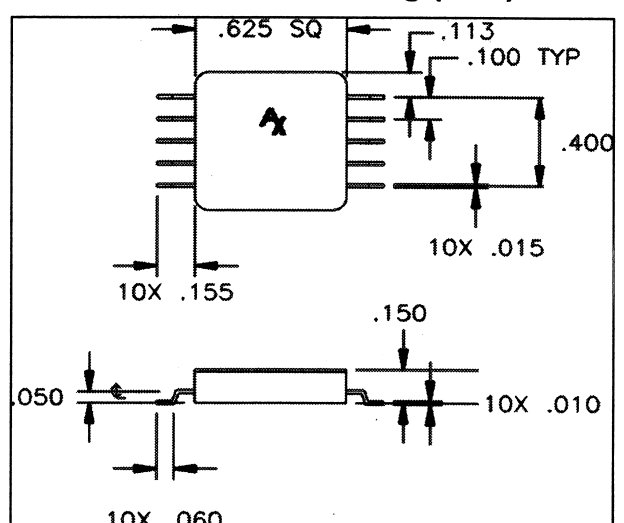
TO-39 Package (T10)



.500" Flatpack (FP4)

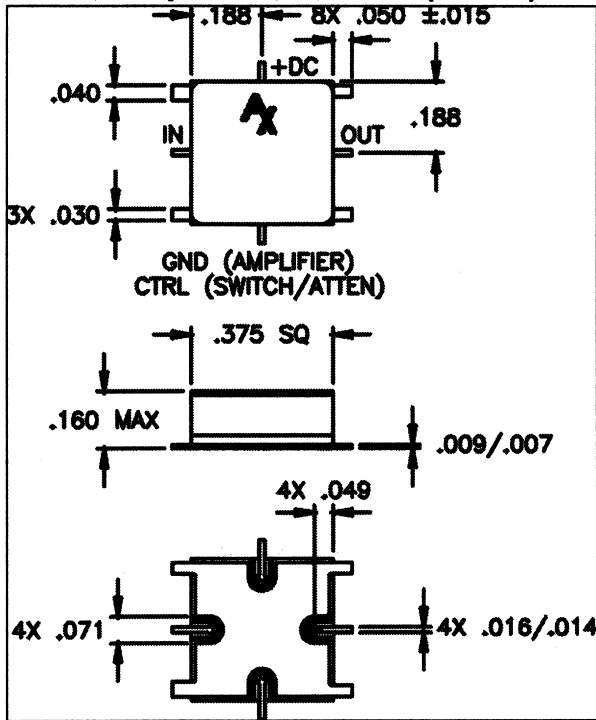


.625" Gullwing (SG4)

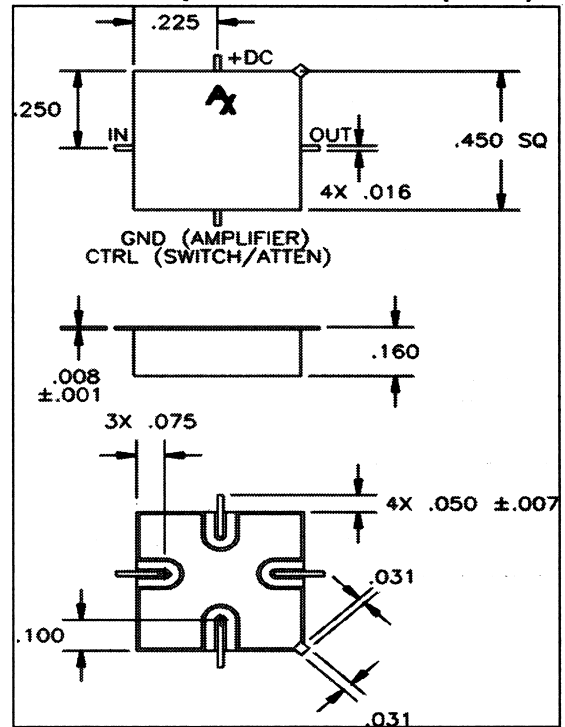


Amplifier Outline Drawings

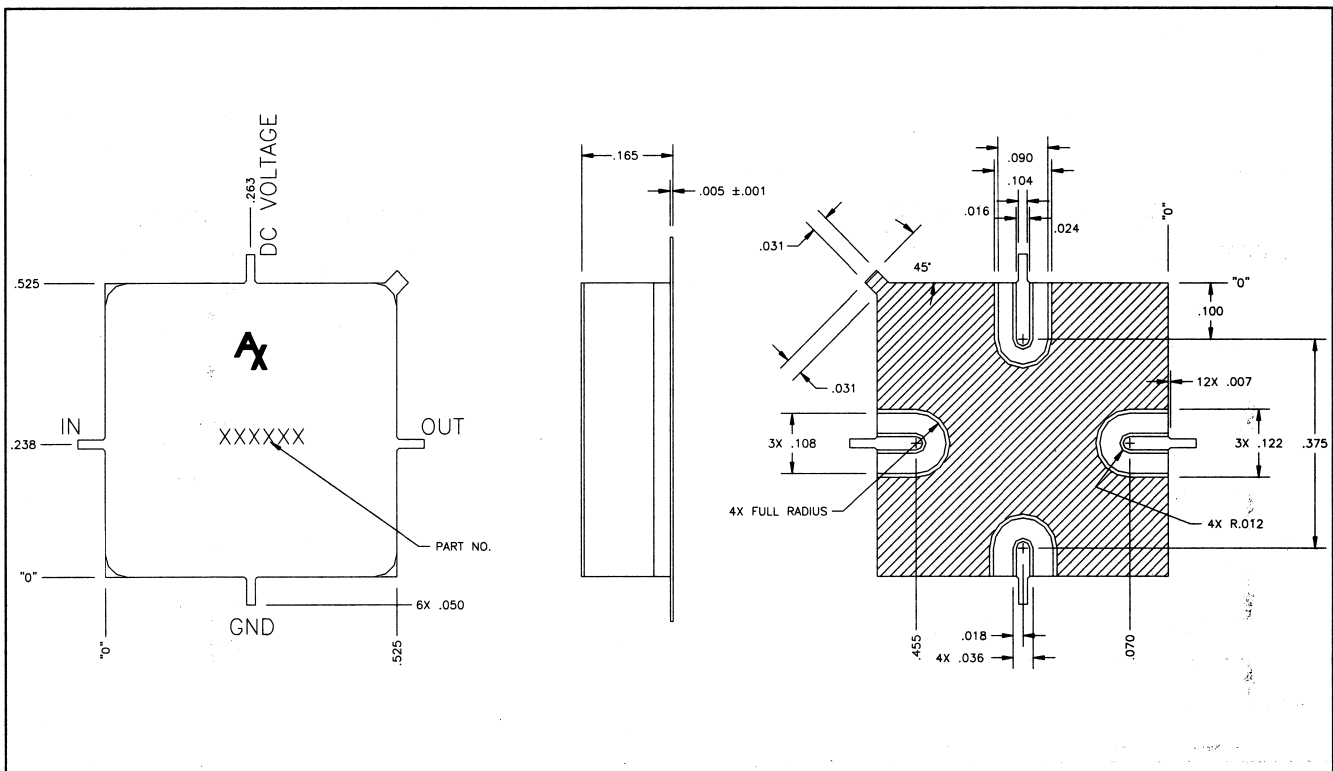
.375" Sq. Surface Mount (SM-11)



.450" Sq. Surface Mount (SM-3)

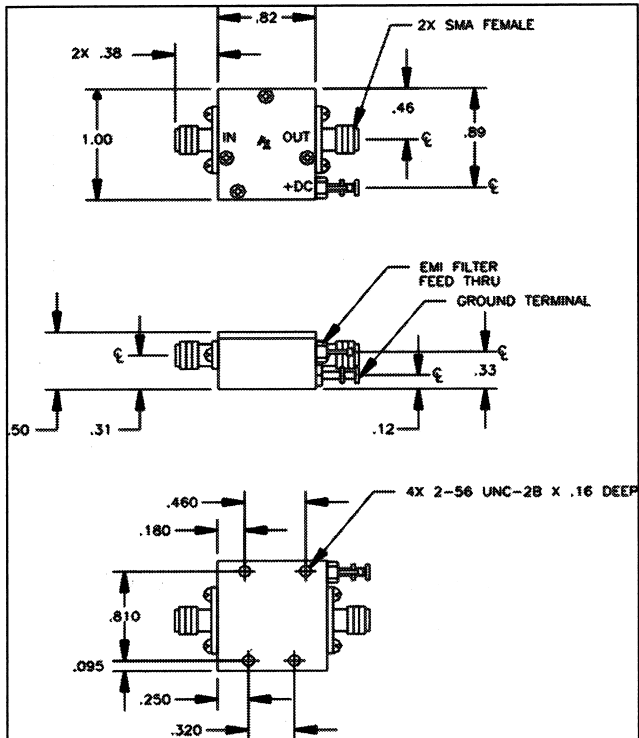


.525" Surface Mount (SM-19)

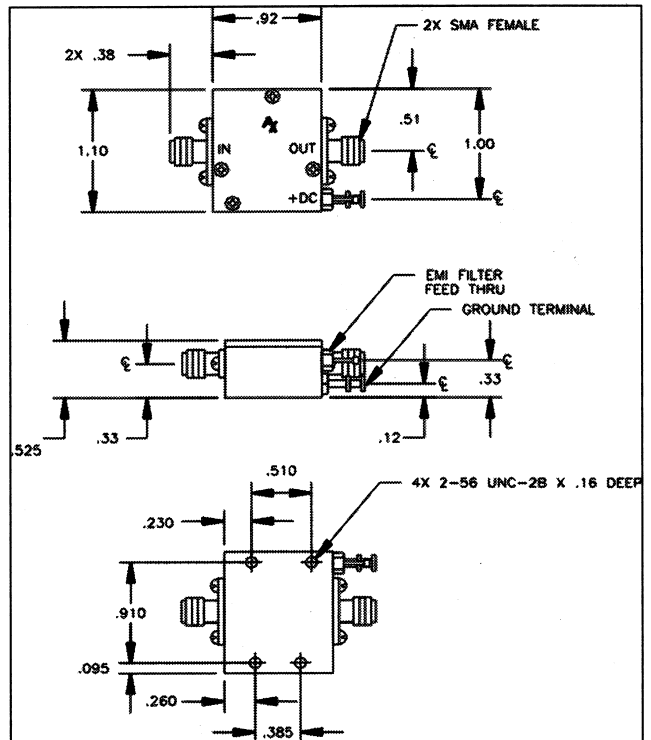


Amplifier Outline Drawings

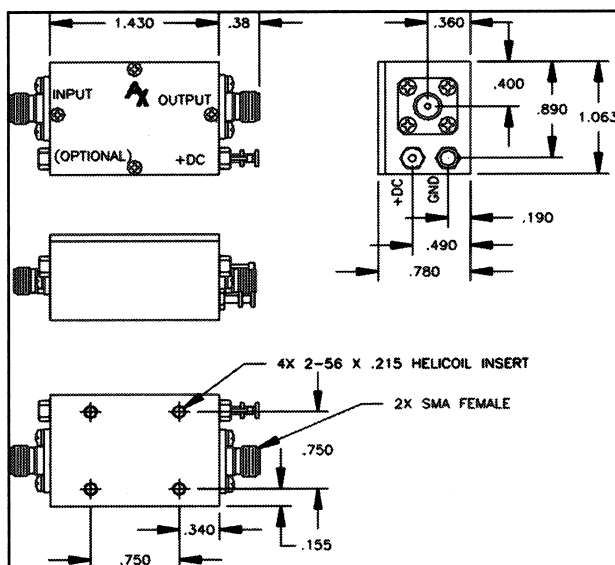
**SMA Connectorized Housing (H1)
(For TO-8 Packages)**



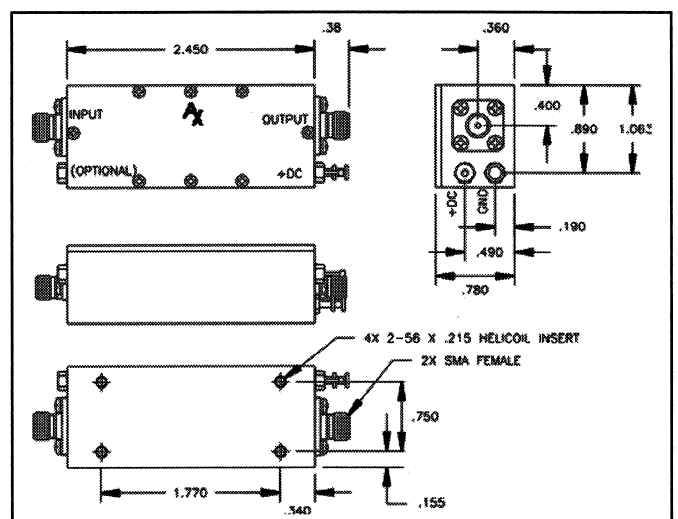
**SMA Connectorized Housing (H2)
(For TO-8B Packages)**



**SMA Connectorized Housing (H3)
(Two Stage For Two TO-8 Packages)**

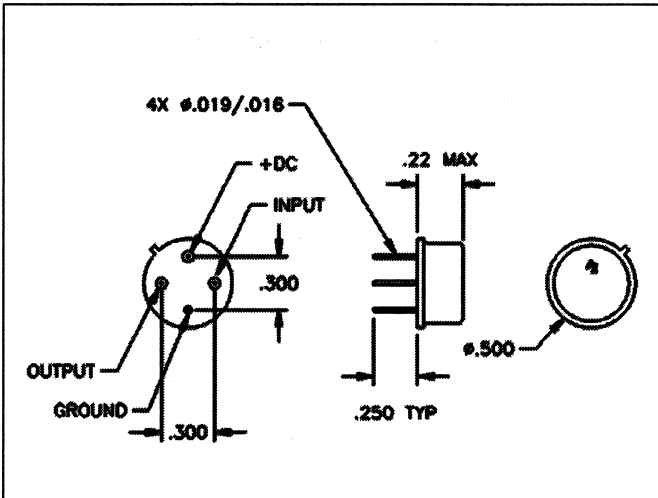


**SMA Connectorized Housing (H4)
(Three Stage For 3 or 4 TO-8 Packages)**

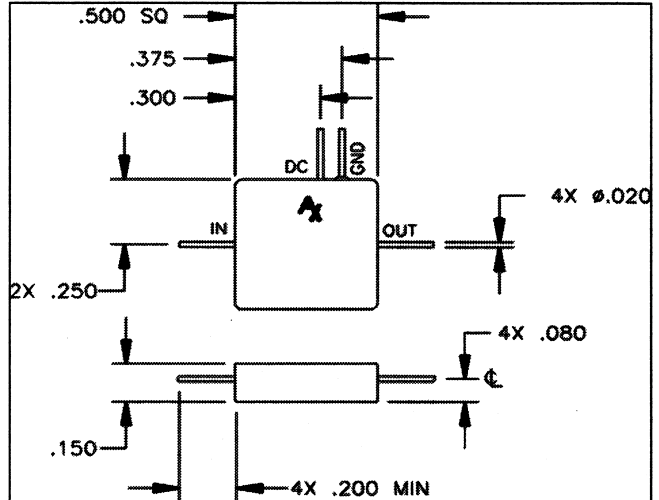


VCO Outline Drawings

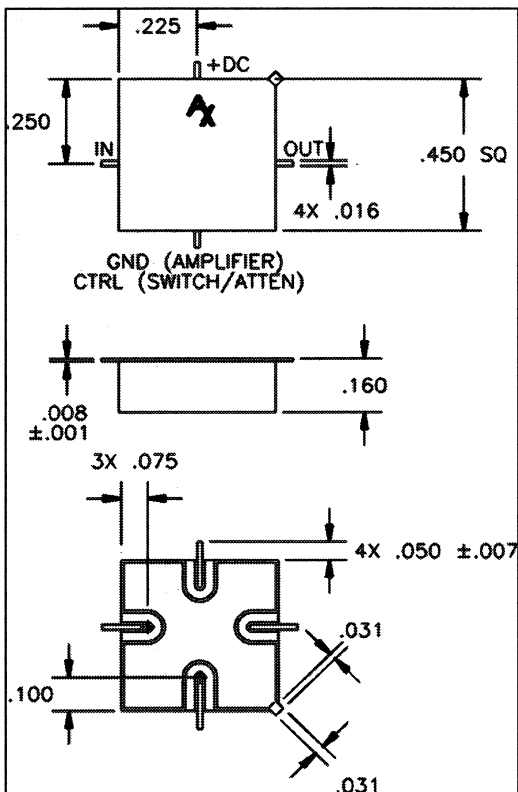
TO-8 Package (T4)



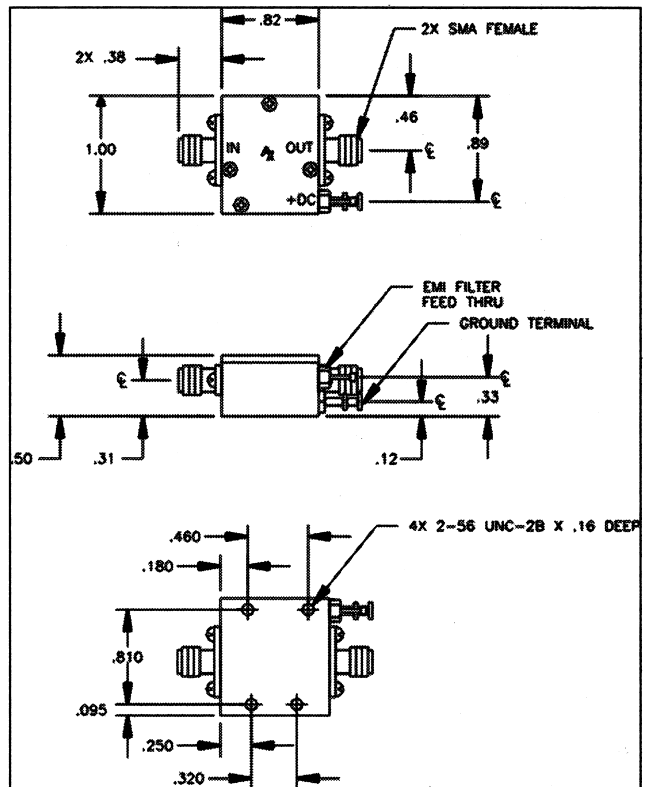
.500" Flatpack (FP4)



.450" Surface Mount (SM-3)



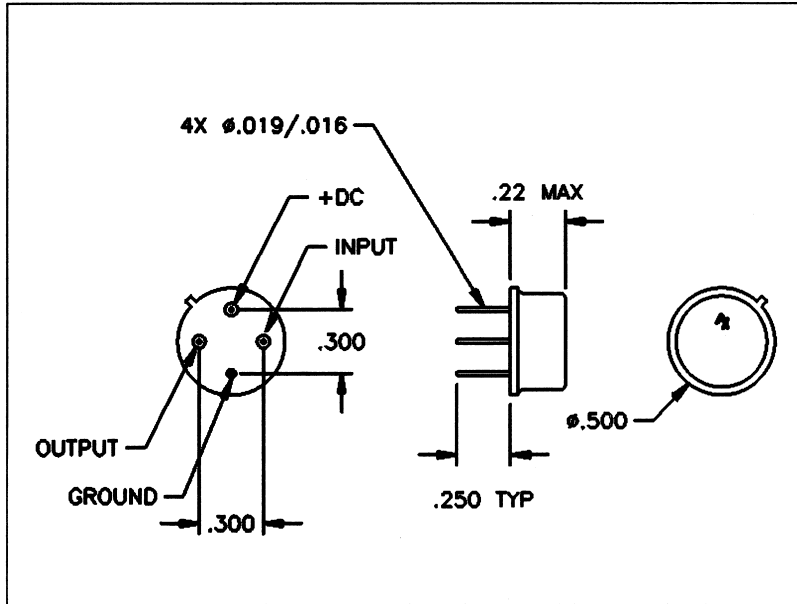
SMA Connectorized Housing (H1) (For TO-8 Packages)



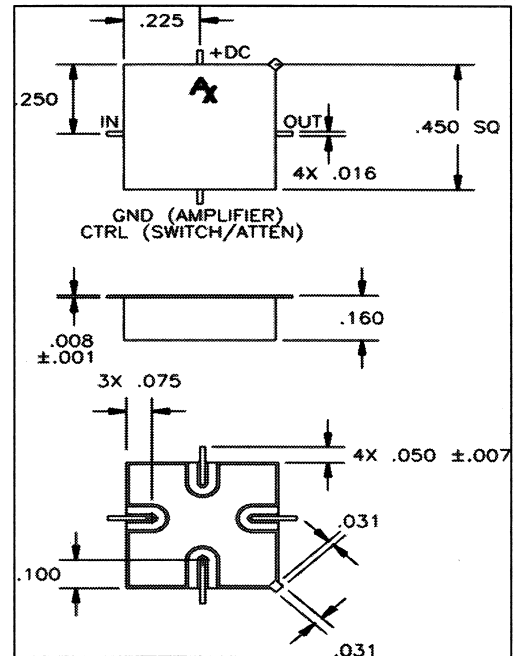
Limiting Amplifiers, Limiters and Detectors

Outline Drawings

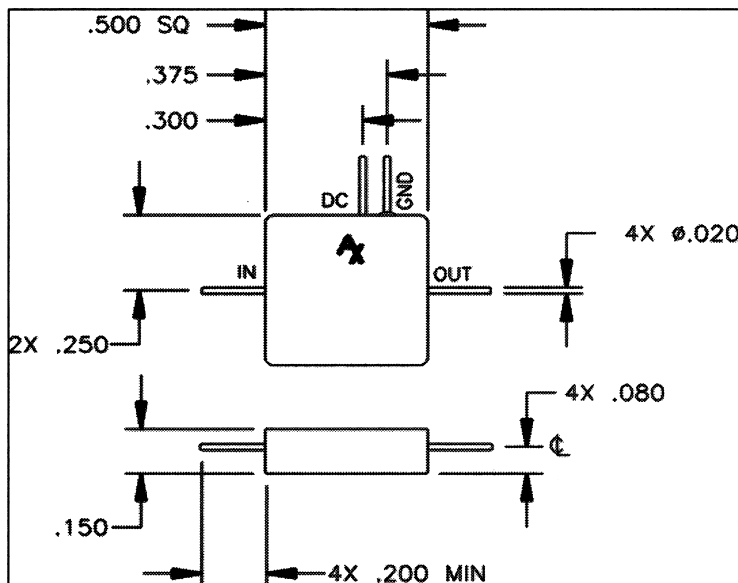
TO-8 Package (T4)



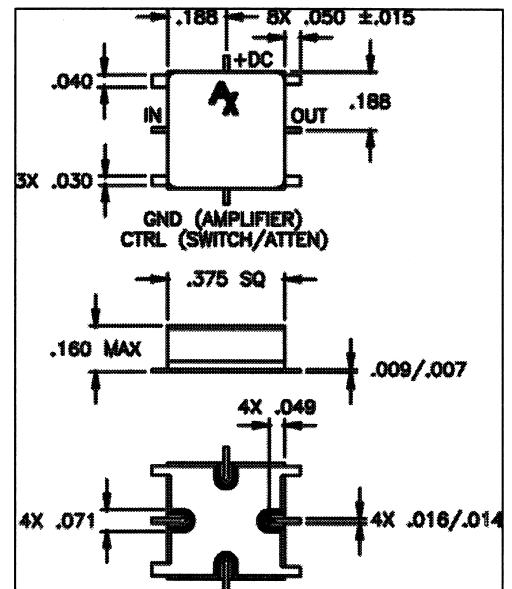
.450" Sq. Surface Mount (SM-3)



.500" Flatpack (FP4)



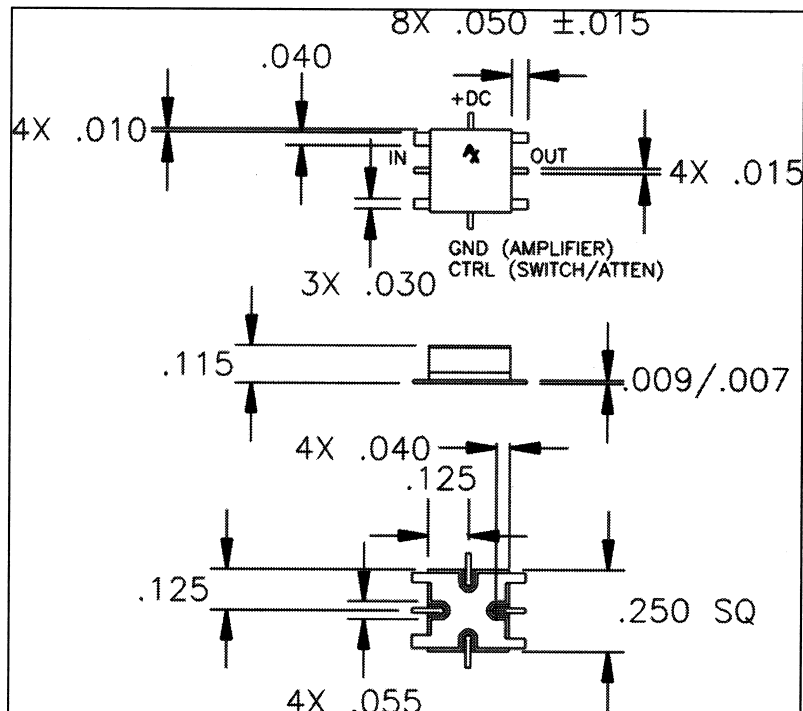
.375" Sq. Surface Mount (SM-11)



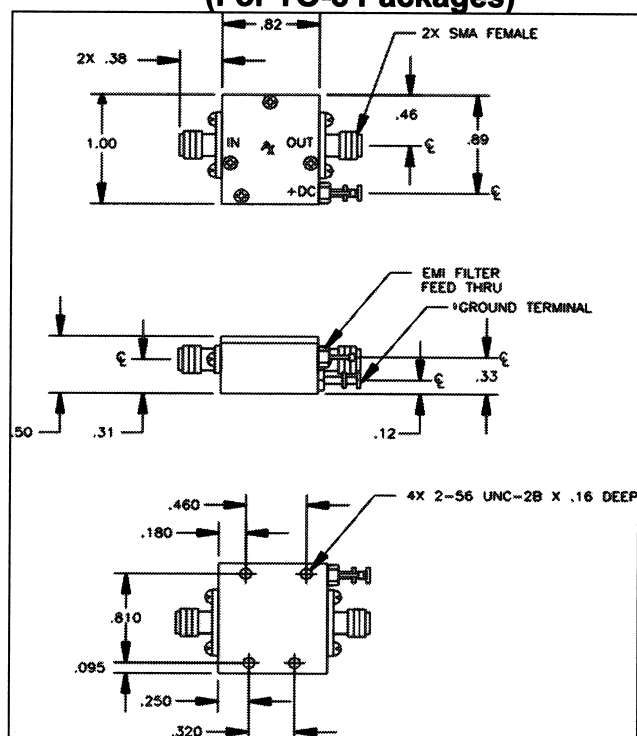
Limiting Amplifiers, Limiters and Detectors

Outline Drawings

.250" Sq. Surface Mount (SM-12)

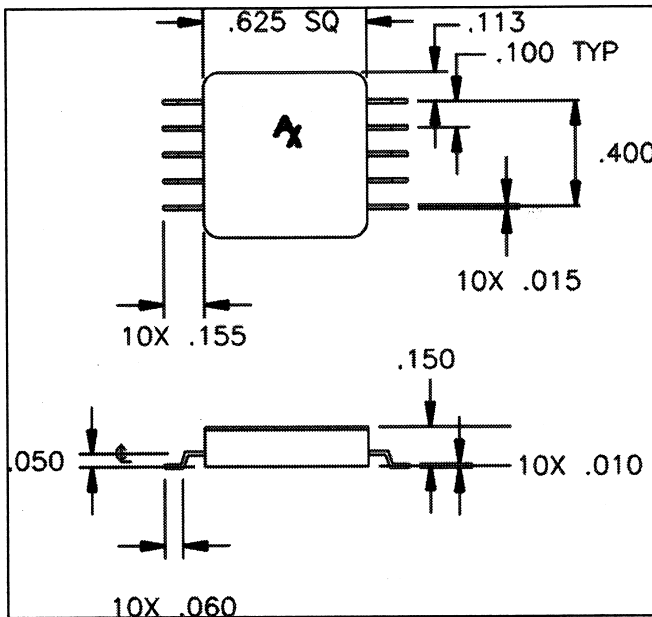


SMA Connectorized Housing (H1) (For TO-8 Packages)

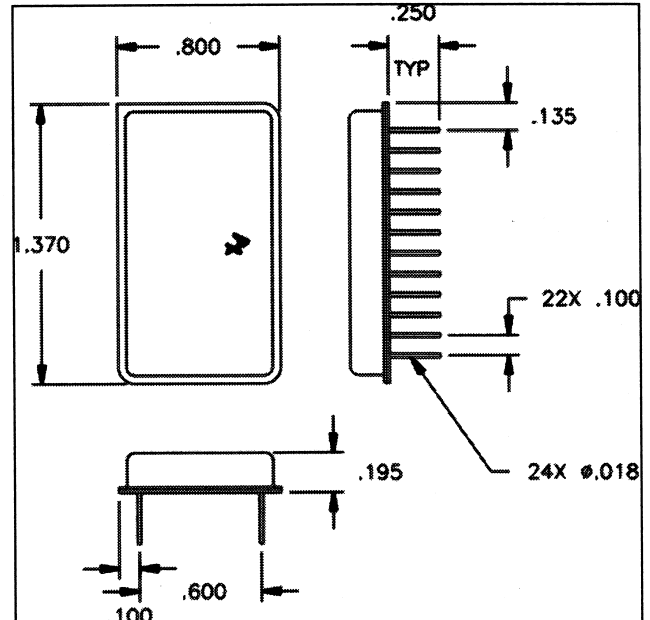


Digital Attenuator Outline Drawings

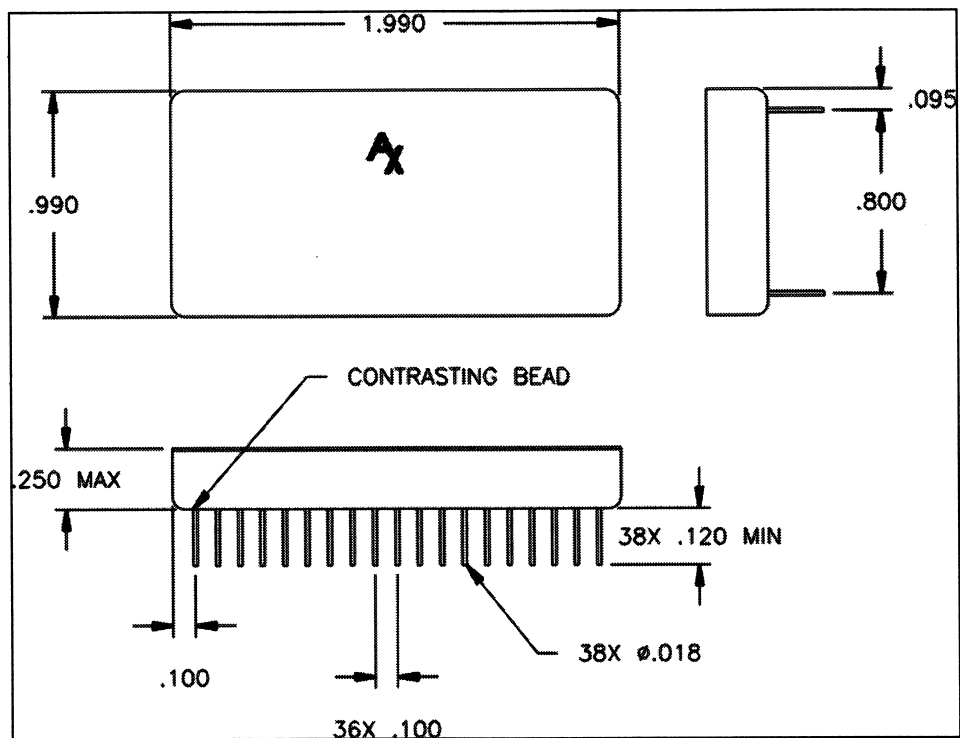
.625" Gullwing Package (SG4)



.800" x 1.37" DIP Package (DP5)

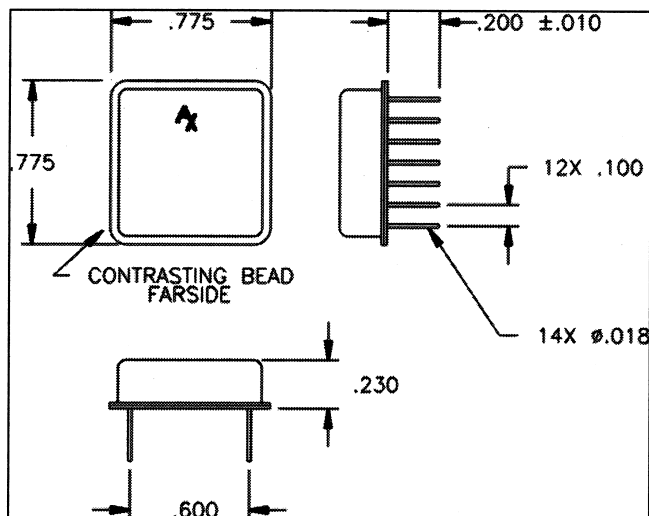


.990" x 1.99" DIP Package (DP8)

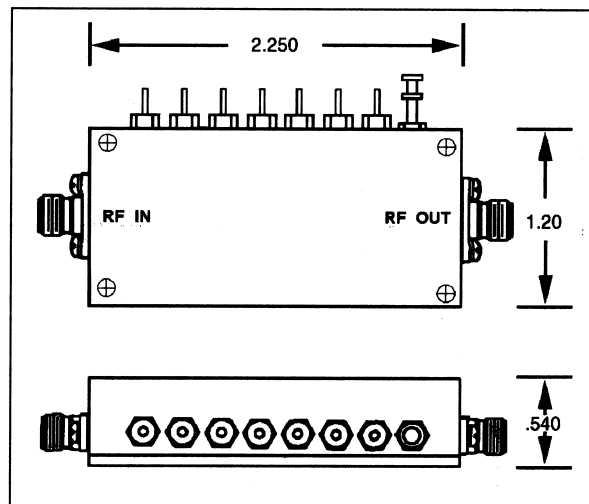


Digital Attenuator Outline Drawings

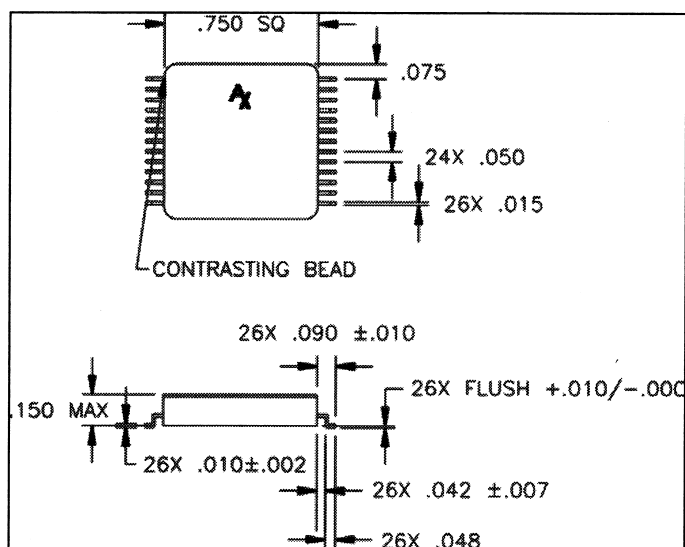
.775" Sq. DIP Package (DP11)



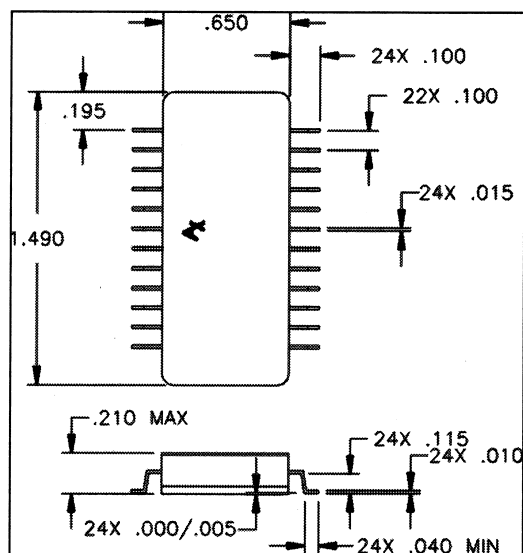
Attenuator SMA Connectorized Housing



.750" Sq. Gullwing Package (SG2)

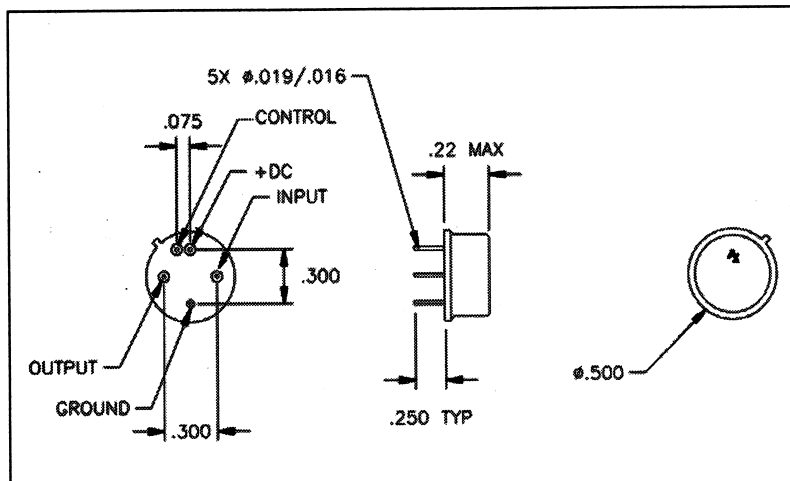


.650" x 1.490" Gullwing Package (SG6)

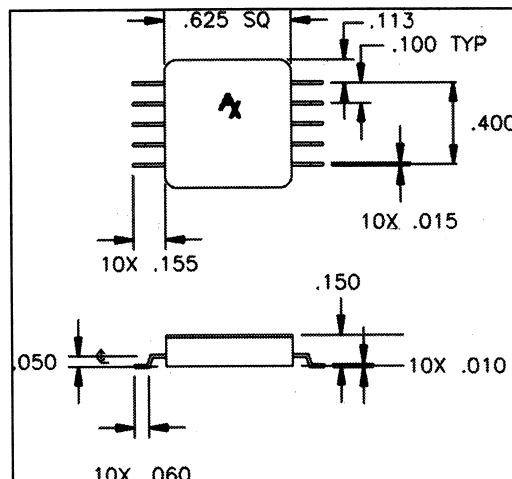


Voltage Variable and Linearized Attenuators & Linearizer Outline Drawings

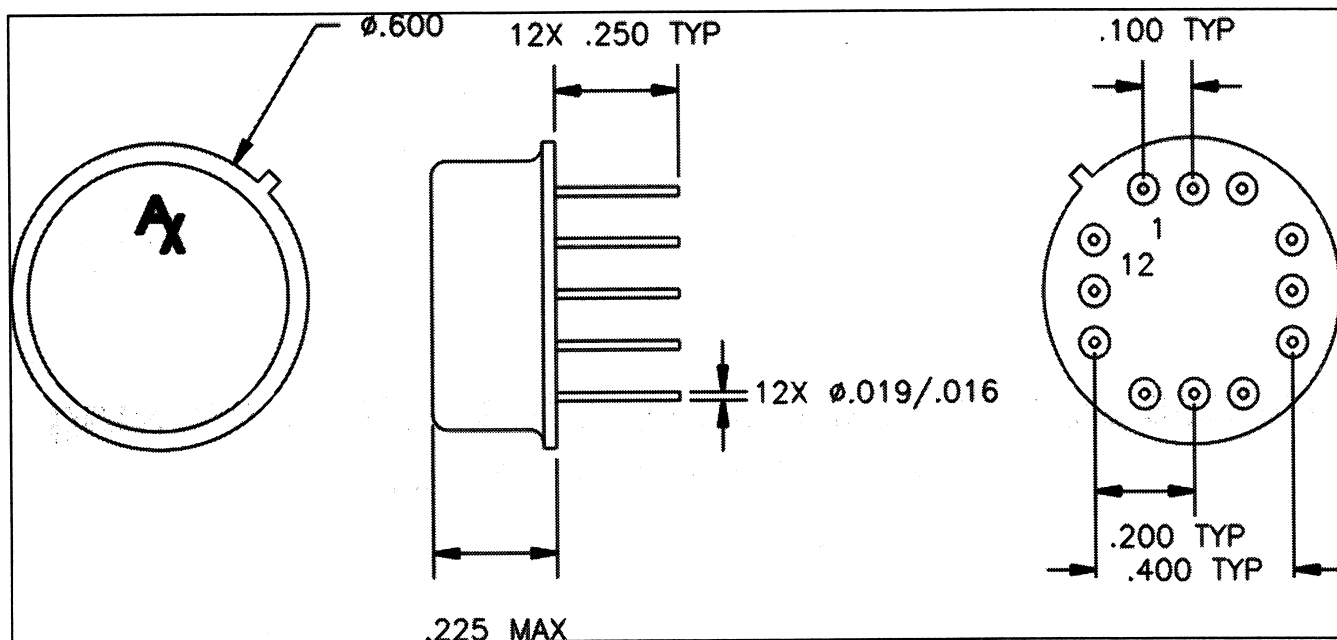
5 Pin TO-8 Package (T5)



.625" Sq. Package (SG4)

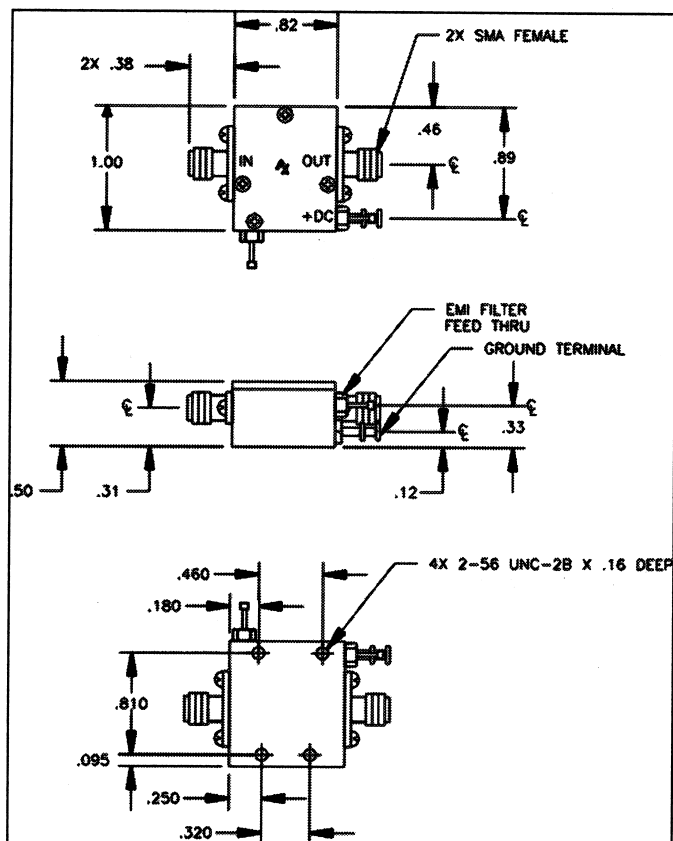


12 Pin TO-8B Package (T9)

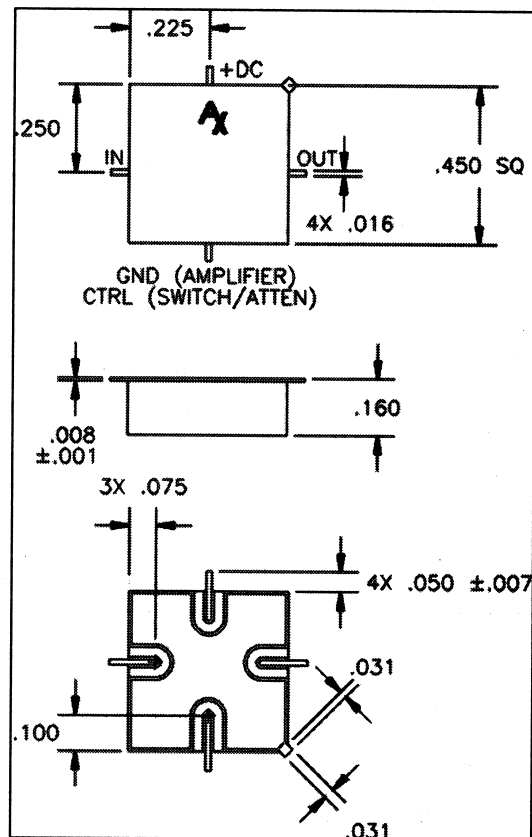


Voltage Variable and Linearized Attenuators & Linearizer Outline Drawings

SMA Connectorized Housing



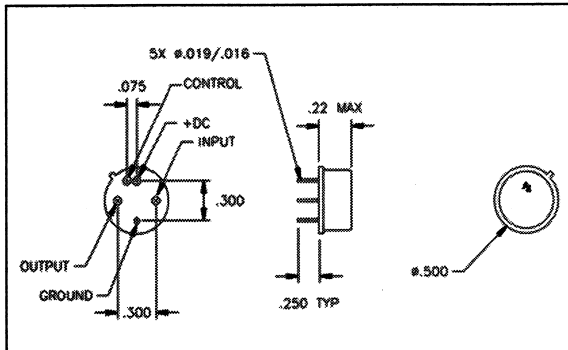
.450" Sq. Surface Mount Package (SM3)



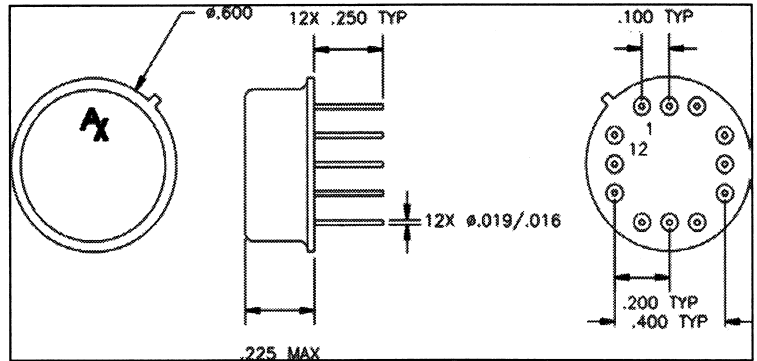
**Please contact the factory if the outline drawing
you need is not listed.**

Switch Outline Drawings

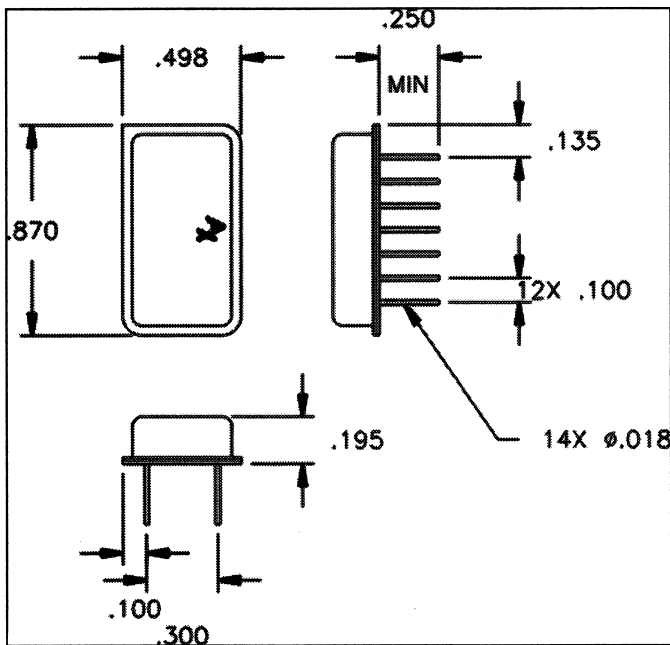
5 Pin TO-8 Package (T5)



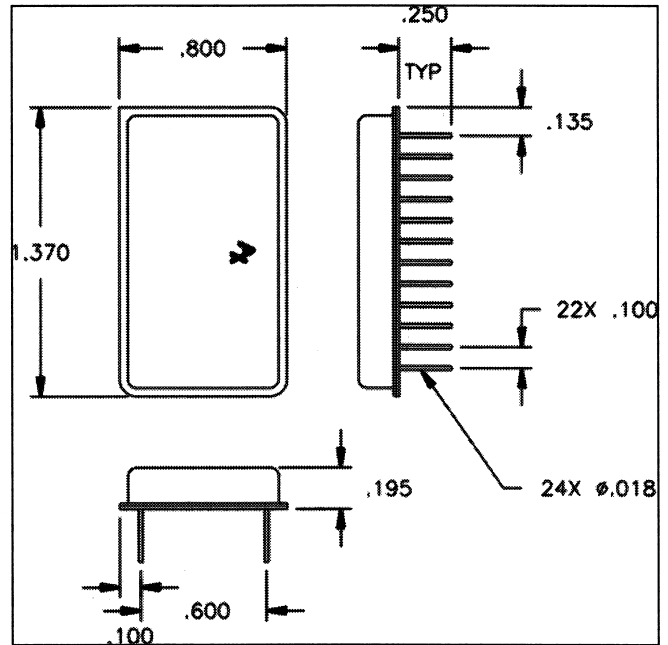
12 Pin TO-8B Package (T9)



.498" x .870" DIP Package (DP3)

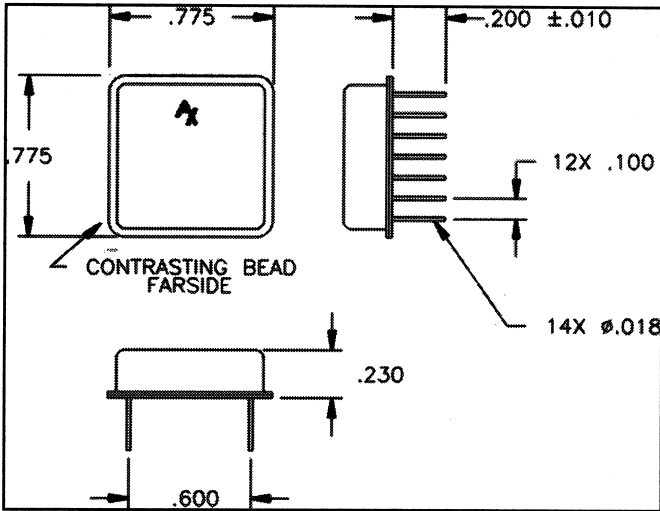


.800" x 1.370" DIP Package (DP5)

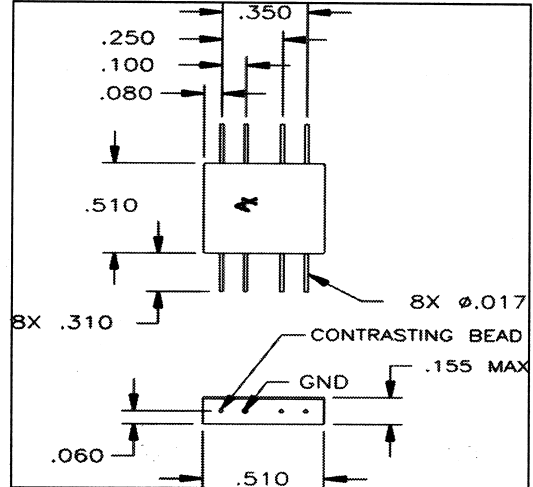


Switch Outline Drawings

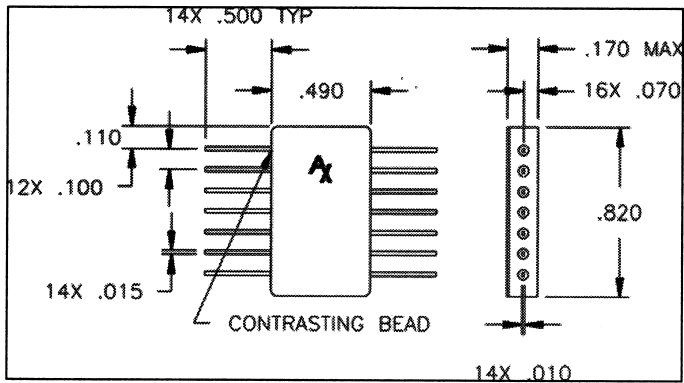
.750" Sq. DIP Package (DP11)



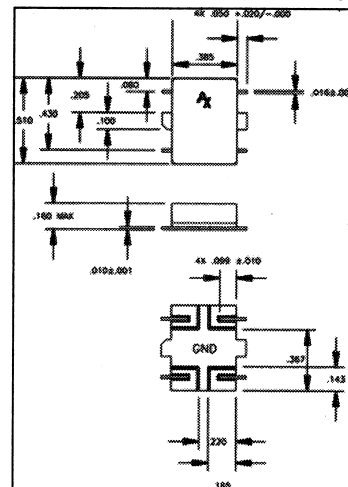
Flatpack Package (FP11)



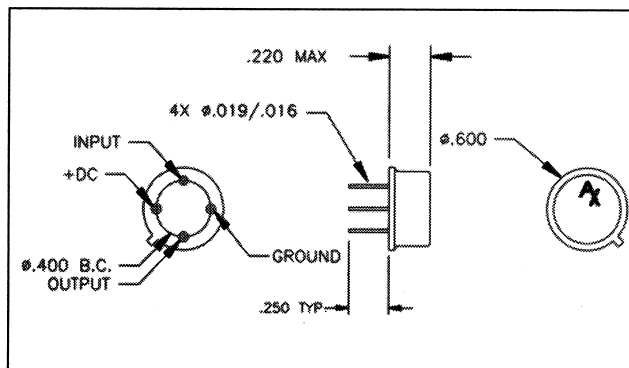
Flatpack Package (FP13)



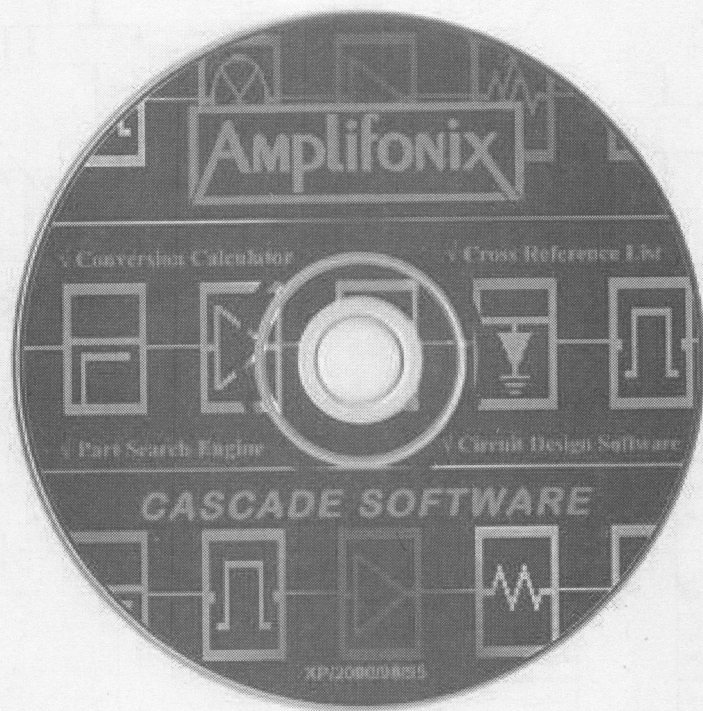
Surface Mount Package (SM2)



4 Pin TO-8B Package (T8)



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